Skyways

FOR BUSINESS

JUNE, 195

OFFICIAL PUBLICATION OF NATIONAL BUSINESS AIRCRAFT ASSOCIATION

- CAA'S 20TH YEAR SALUTED
- ROUND TABLE: SPARK PLUG AND IGNITION
- TIGHT BUSINESS SCHEDULE FOR ADHESIVE SALES
- THE FACTS OF LIFE
- BUILT-IN SERVICEABILITY AIDS BOTH THE PILOT AND THE SERVICEMAN

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O-290-D2B	4	229	80/87	140	135	264
O-320-A1A	4	274	80/87	150	150	272
O-320-B1A	4	279	91/96	160	160	278
O-340-A1A	4	277	91/96	170	170	280
O-360-A1A	4	286	91/96	180	180	285
O-435-A	6	228	80/87	190	190	392
O-540-A1A	6	295	91/96	250	250	396
VO-435-A1D	6	279	80/87	260	250	390
GO-435-C2B2	6	228	80/87	260	240	430
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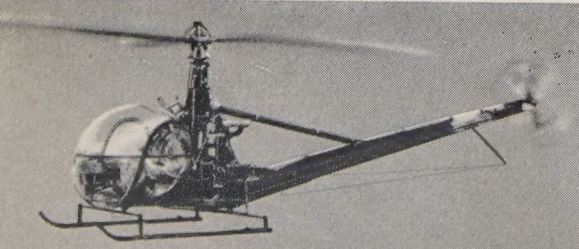
GO-480-G1B6	6	275	100/130	295	280	464
GO-480-G2D6	6	275	100/130	295	285	442
VO-540-A1A	6	*	80/87	310	305	435
GSO-480-B1A6	6	284	100/130	340	320	498
SO-580-A1B	8	285	100/130	400	350	578

*Pending



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Information regarding regular or Associate Membership in the National Business Aircraft Association is readily secured by writing to the Executive Director and Secretary of NBAA at 344 Pennsylvania Building, Washington 4, D.C.

Membership in this non-profit and independent aviation organization is based on the recognition of business flying problems common to all users of aircraft for their business purposes and to those engaged in supporting the operation, servicing, equipment, and manufacture of business aircraft.

Among the fields in which NBAA is concerned are: improvements in airways and airports, better weather service, expansion in communications and air navigation facilities, higher standards of airport services, improved aircraft parts distribution, equitable tax rulings for business aircraft operations, greater recognition of the airplane as a necessary tool in modern business and industry, better air traffic control procedures, professional status for qualified business pilots, and aircraft designed to meet the special requirements of business flying.

National Business Aircraft Association
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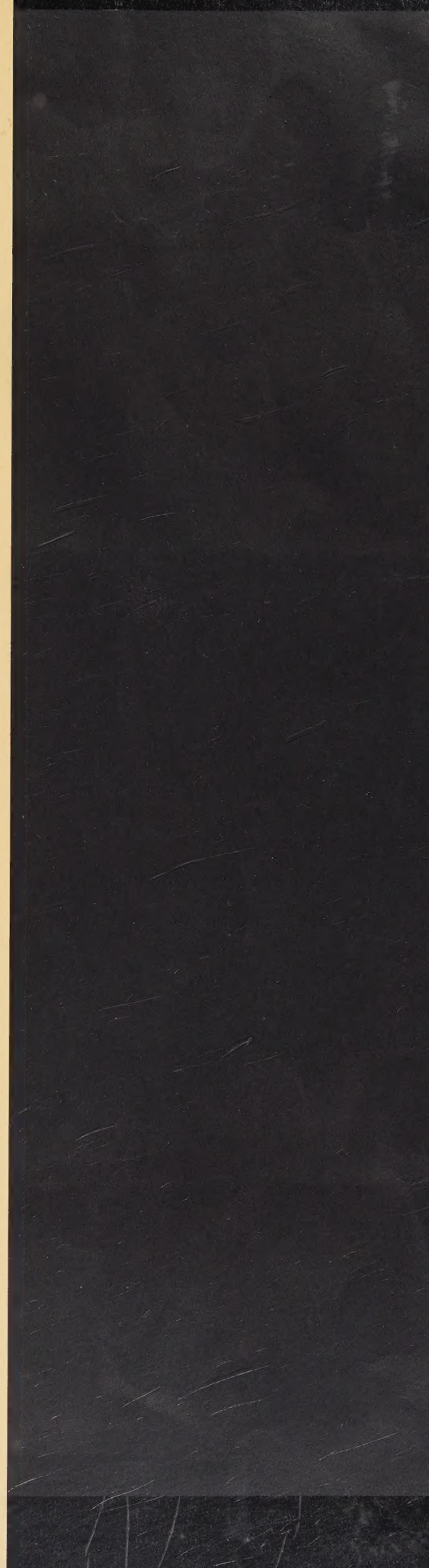

Operations and Maintenance Roundup

So you couldn't make it to the Reading Aviation Maintenance Meet? Well, don't feel too badly because in the July issue of Skyways you will find a "rain-check." We made it there and taped the very spirited forum on "Aviation Maintenance Standards," moderated by George H. Weitz, chief, General Maintenance Branch, CAA.

If you were there, this is one souvenir that you didn't carry away with you and which you will enjoy re-hashing with the guys at the home base hangar, QB meetings, etc.

What else is "cooking"? Something of vital importance to every business pilot and high-standard fixed base operator. Skyways is re-issuing a revised, improved, more usable Airport Service Guide that will tell of available services and facilities of the Fixed Base Operators for the fast increasing number of business aircraft.

For the first time, you will have immediately at hand a visual means of locating easily on any airport THE Fixed Base Operator you seek, the one best equipped to serve you! This and other new, vital information important to business aircraft operating in these tax-wise times will be in the Guide.

One company's fleet operations' breakdown for January and February alone indicated the area for service to the pilot represented by the Guide:

Total number of airports used	153
Total States in which landings were made (including Washington, DC, and foreign countries)	39
Total miles flown	284,625
Total number of flights	1,140
Total hours flown	1,923:25

This is one "manual" for pilots' use that has been developed, expanded and improved by and for active, experienced pro' pilots now in the field!

These same working throttle jockeys help to make Skyways the one operational, professional voice for the business aviation field that it has been for some 17 years. Whether you use an airplane as a transportation medium or a working tool or whether you are in the business of selling or serving aviation. Skyways is your book, gleaning the wheat from the chaff of space age, military and subsidized aeronautics.

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JUNE, 1958

Skyways FOR BUSINESS

The official publication of the National Business Aircraft Association

COVER: Bill Lear, right, explains to Herb Fisher, flight evaluation pilot for Skyways and Chief, Aviation Development Div., The Port of New York Authority, the basic concept of "LIFE" (Lear Integrated Flight Equipment) prior to flight at Santa Monica, Calif.

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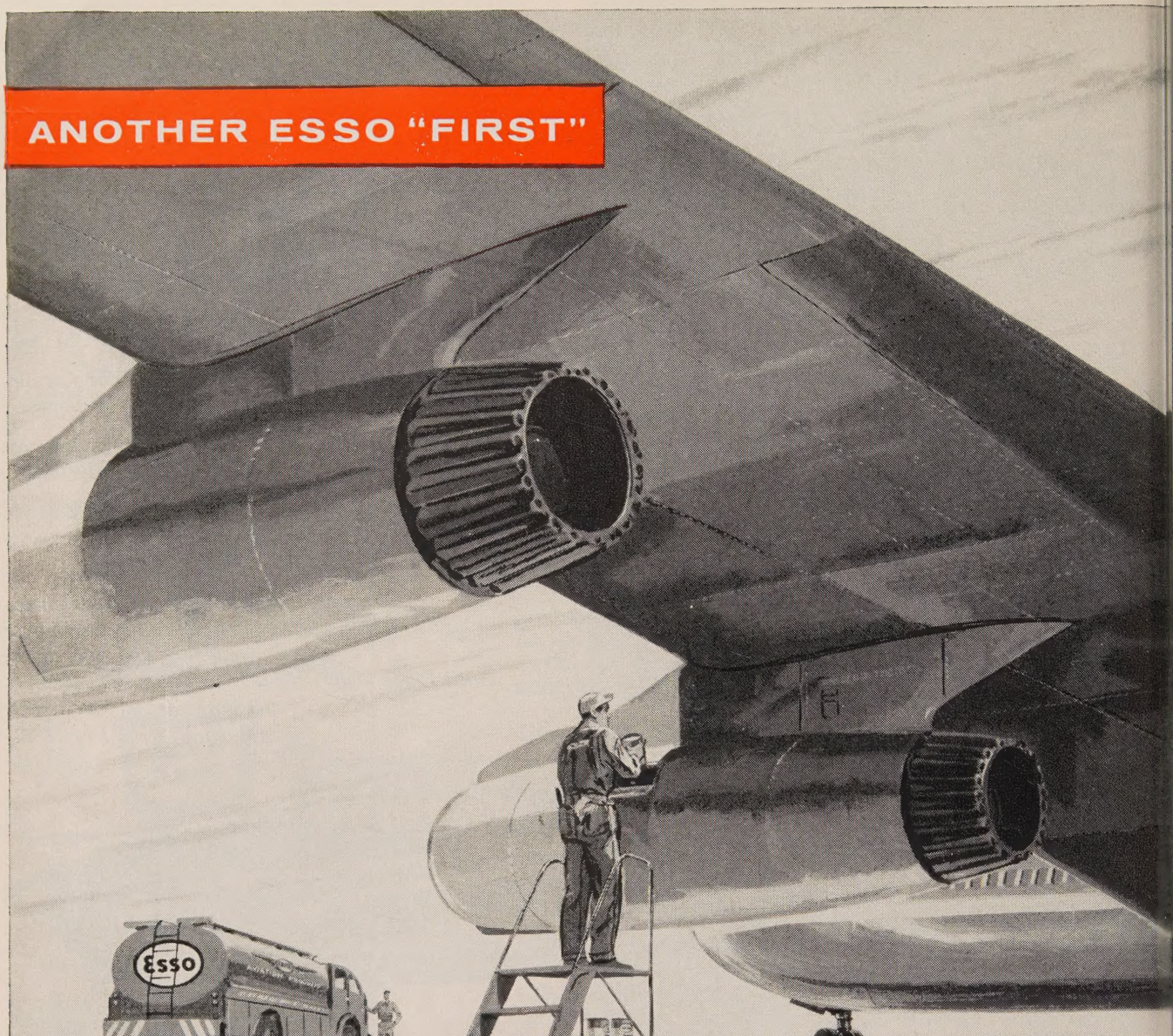

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Editorial

BLOW OUT THE CANDLES, JIMMY

This month the CAA celebrates its twentieth anniversary.

This civil aviation administrative body has been advised, devised, revised, compromised, subsidized, categorized, penalized, aggrandized, and often surprised by civil and military aviation interests, politicians, statesmen, and the common man during these twenty years.

Despite outrageous appropriations buffetings; despite wars and police actions; despite changes in party and administrative leadership; despite low pay scales; and despite all trials and tribulations, CAA has grown.

To the thousands of men and women in positions both lofty in CAA hierarchy and to those on the totem pole, National Business Aircraft Association sincerely thanks them for the work they have done, for the jobs they have tried to do, and for the tasks they will have to perform in the future.

Happy 20th Anniversary!

SEE AND BE SEEN

The greatest loss of life and the worst air collision accidents in our history have occurred in VFR weather.

The airliners that collided over the Painted Desert, the airliner and the military jet in California, and the airliner and the military jet near Las Vegas were all operating under "see and be seen" conditions.

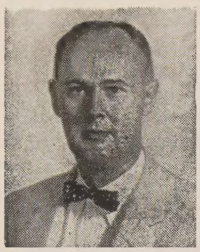
We just simply do not have such collision accidents in instrument weather under controlled conditions. Which points to the fact that "see and be seen" is not good enough with present day speeds and traffic density. Advocating a required lookout man who has no other duties but to watch for traffic is not enough; there are too many blind spots below, above, and behind for the lookout man to observe all traffic. The use of luminous paint which would make moving aircraft more easily seen might be helpful. But the final solution will either be CAA air traffic control of all aircraft under all conditions while flying the airways or "little black boxes" which will permit each aircraft to know at all times what the traffic is around it.

Such little black boxes should not be too difficult.

We know that the facilities and the man power of CAA could not handle the controlled movement of all aircraft in both IFR and VFR weather. We know a lookout man for every aircraft is not practical either in efficiency or economy. All of which seems to indicate that we better get busy in making the little black box; a little black box that can be monitored by the crew and show azimuth and distance for a minimum radius of 50 miles of every other airplane in the area.

And until we get such a little black box, pilots should be very wary of changing altitude in CAVU weather without being very sure of a clear path ahead.

NBAA . . . Director's Notes



A highly successful series of safety award meetings sponsored last month by the Ohio Aviation Division and the National Safety Council brought more than 700 Ohio aircraft owners and pilots together at meetings held in Columbus, Cincinnati, Toledo and Akron.

NBAA, as a supporter of the Flying Green Cross program, is proud to salute the owners, pilots and mechanics whose aircraft now bear the Flying Green Cross symbol—emblematic of their safety consciousness and highly laudable safety record.

The program, actively sponsored and energetically handled by C. E. A. Brown, Director of the Ohio Aviation Division, brought all phases of general aviation into one picture—something that no flying safety program has heretofore accomplished.

To Bob Renneker of Nationwide Transport, Columbus; to Nelson Rokes of Procter and Gamble; to Tracy Service of Libbey-Owens-Ford Glass; and to "Shorty" Fulton, Akron Municipal airport manager—NBAA's sincere thanks for helping to arrange for these programs.

It is to be hoped that other state aviation commissions will follow the example of Ohio in encouraging and honoring safe flying practices by a similar Flying Green Cross program.

* * *

It's about time the CAA and the CAB became more than just "aware" of the fact that the business fleet now comprises jets and turbo-prop aircraft.

This fact was highlighted by recent CAB proposal to permit only airline crews to receive flight training and operational experience in multi-engined jets and turbo-props prior to completion of the type certification of the aircraft.

Proposal is economically sound for the airlines as it would permit them to cut down costly time-lag now present between complete type certification and placing the aircraft into revenue producing service.

By issuing a provisional certification for the new aircraft the crews and ground personnel could be trained in the use of the aircraft in advance of final type certification.

In strong protest to CAB—charging arbitrary and discriminatory regulations—NBAA challenged the exclusion of business pilots from the same privileges.

Many business organizations have each pledged from one to five million dollars for jet and turbo-prop aircraft and, if the proposed CAB regulation remains unchanged, they would not be able to use the aircraft until their crews were thoroughly checked out AFTER the aircraft had received type certification.

The CAA's failure to provide civil jet approach procedures and for providing for non-airline jet and turbo-prop handling at airports was also called to the CAA's attention.

Non-airline civil jets are now flying with no provisions made for their approach procedures published or near publication. "Under study" is the CAA's reply.

When the airport problem was called to the CAA Administrator's attention an immediate response was made to NBAA inviting a conference with the Administrator.

The airlines' constant drum beating about their approach into the "jet-age" is quite fascinating—but, brethren of the CAA and CAB—business flying is there NOW!

Bill Lawton

Suite 344

Your Board of Directors did not meet during the month of April. Nevertheless, they have all been guiding National Headquarters with all the difficult problems that have arisen, and we have had them. Those fortunate enough to attend NBAA's last annual meeting and noted the favorable impression on non-aviation people appreciate what these problems mean.

This year we are looking forward to the following firms either having something in the hardware, proto-type or jet, a few of which are dependent upon military orders. Aero Design; Boeing; Fairchild; Grumman; Lockheed; McDonnell; Mooney; North American; Piper; Trecker; Aircraft Marine Eng. (This is just the fixed wing models and helicopter boards are full of brand new helicopter designs.)

We are assured that eight of these will be displayed in Philadelphia, plus any others that may in the meantime become available.

NBAA's 11th Annual Meeting is shaping up now. NOTE to NON-MEMBERS of NBAA: MEMBERS will always have first choice of exhibit space and suites and if any are left, first come, first served.

MAILINGS. CAB's CAR Draft Release 58-9, Special Regulations to Provide for Provisional Certification and Operation of Multiengine Turbine-Power Transport Airplanes for which Type Certificates Have Not Been Issued—which favors airline jet and turbo-prop purchasers over business purchasers; Maintenance Bulletin #7; First steps taken toward positive control of all aircraft operating 20,000 to 35,000 feet; CAA conducting nationwide survey to speed processing of supplemental type certificates; Airway "User Charge" Legislation Nears; Proposed AD's on DC-3s, Lockheed 18 and PV-1 aircraft having bromochloromethane (CB) fire extinguisher systems; Weather Bureau Aviation Service—(Be sure to read Dick Groux's article "Weather Wonderland," May Skyways, page 18.) Am sure you will be amazed at the facts that are in black on white.

DON'T FORGET YOUR ENTRY FOR "MISS BUSINESS AVIATION, 1958". Deadline date is August 1, 1958.

NOTE TO THE "WOMEN FOLKS" of NBAA—Plan to visit Philadelphia this fall with your husband—while he is working, you can see the sights, both historic and ultra-modern, in the American city that offers truly exciting things. Tour the nation's most revered historic shrines.

National Headquarters' walls now have pictures of the Grumman Gulfstream and the Lockheed Jetstar—but "Skeets," we do not have one of the Fairchild Friendship. How about it?

WELCOME TO NEW MEMBERS: CLYDE W. WOOD & SONS, INC., North Hollywood, Calif., General Engrg. Contractors, operating Piper Apache. Stanley B. Wood, V-P is NBAA Rep., and Merle F. Edgerton, Chief Pilot. (REGULAR MEMBER); FAIRWAYS CORP., Wash., D.C., Contract Air Carrier, operating two DC-3s and a CV-440. George F. Young, Pres., is NBAA Rep. and Chief Pilot; NAPIER ENGINES, INC., Wash., D.C., manufacturers of fixed and rotary wing gas turbine engines; industrial & marine engines; rocket engines. Raymond J. Pflum, V-P (Sales) is NBAA Rep. and Chief Pilot, operating Beech Bonanza. (ASSOCIATE MEMBERS.)

And so, business aviation, grows and grows. *Corda Mae Cearnal*

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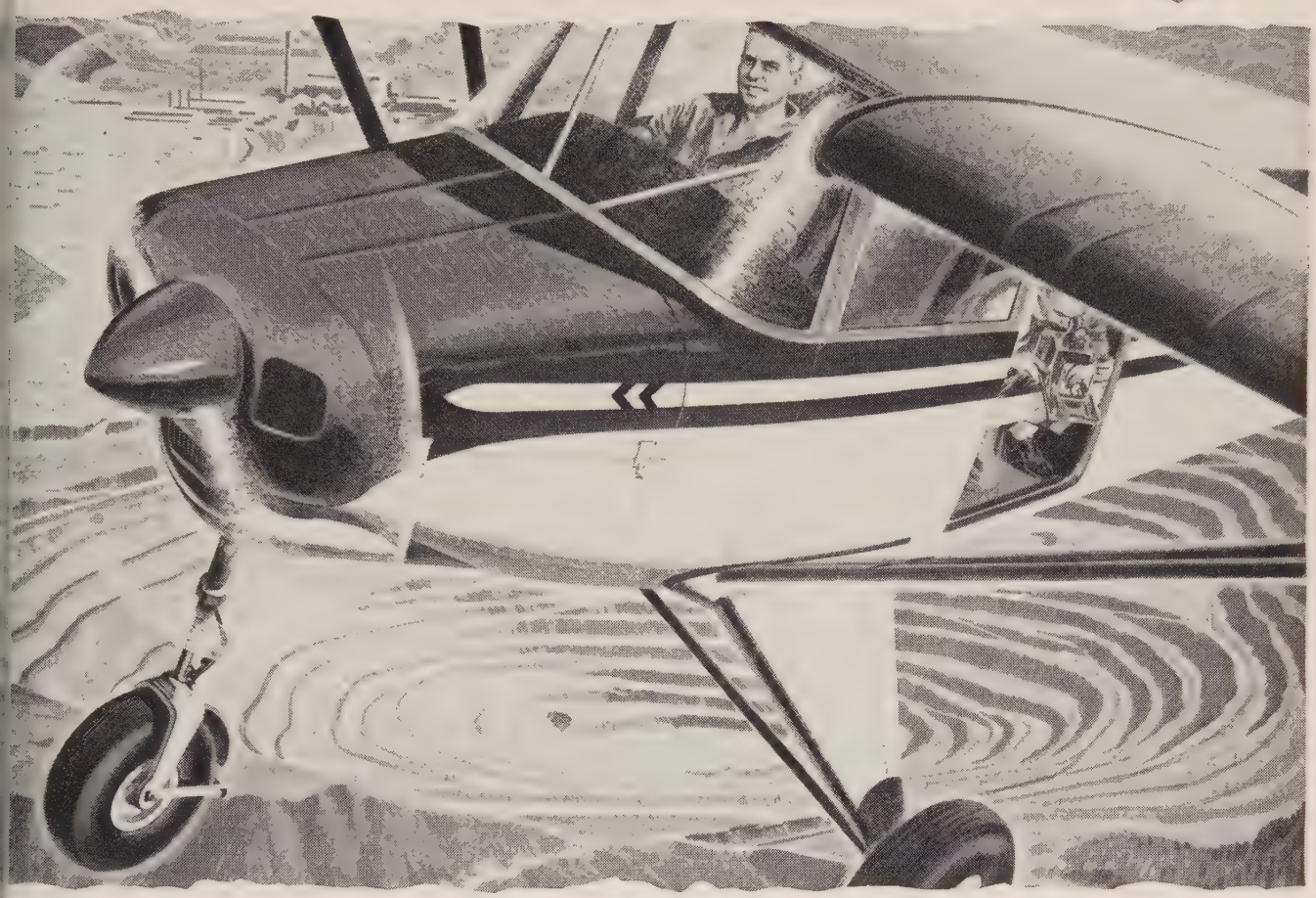

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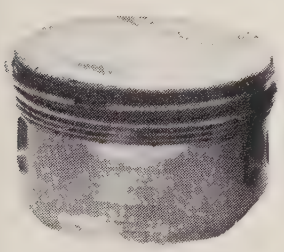

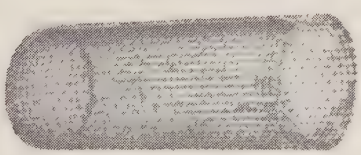

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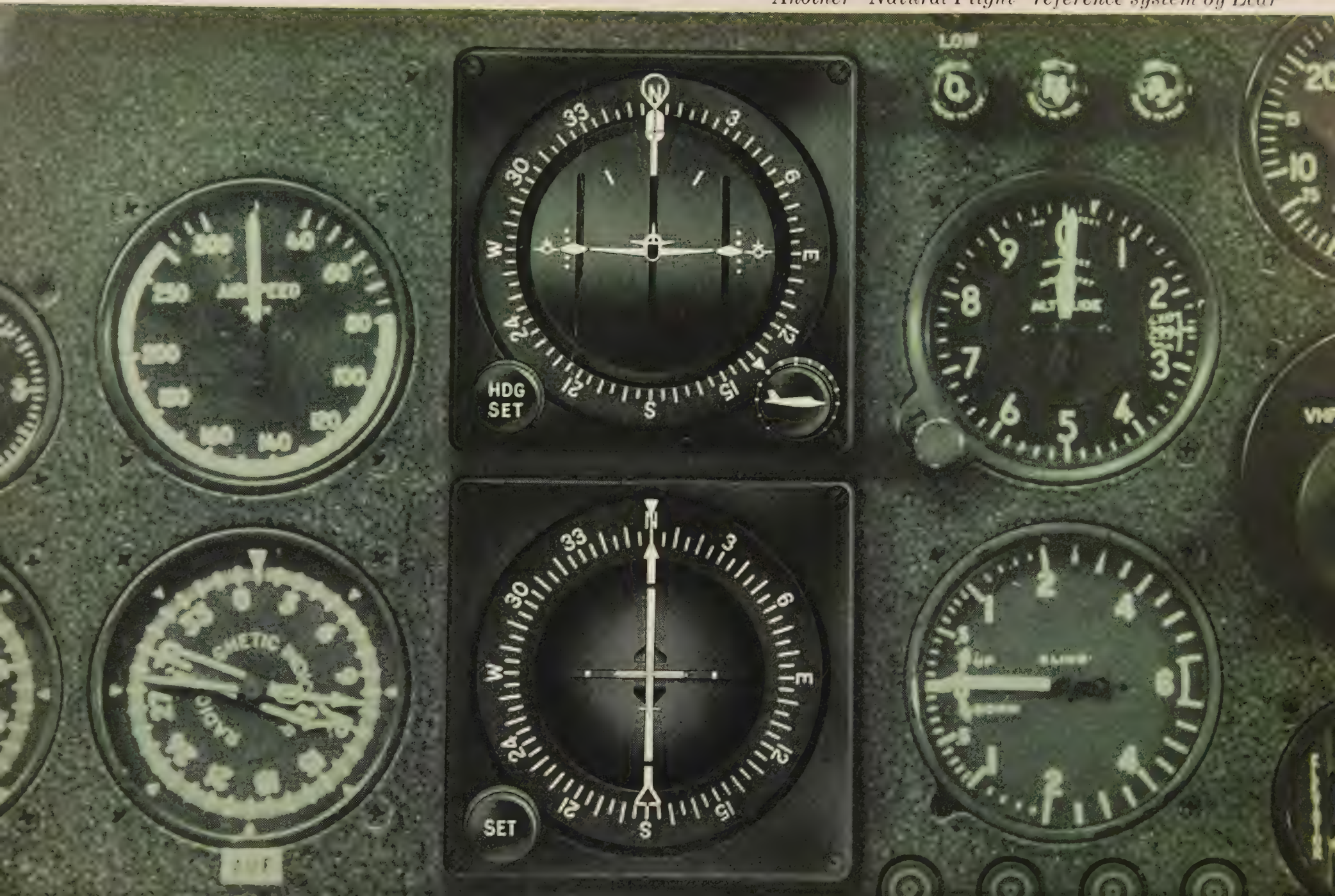

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ST 7-5963 **ST 7-9472**

Circle No. 6 on Reader Service Card

Aviation Roundup

AIRWAYS MODERNIZATION BOARD selects Atlantic City, N.J., after examining over 1800 airports for proposed Nat'l Aviation Facilities Experimental Center. First year operation has been set at approx $12-million. Board members are: Mr. Elwood R. Quesada, Chairman; Malcolm A. MacIntyre, Asst Under Secy; and Louis S. Rothschild, Under Secy of Commerce for Transportation. Atlantic City Naval Air Station was chosen as environment having both simulated and real traffic, where intricate problems of procedure can be formulated.

★ ★ ★

AERO DESIGN & ENGINEERING CO. will continue to operate under the same management as a subsidiary of the ROCKWELL STANDARD CORP. of Penna. The acquisition of stock is subject to S.E.C. Registration.

★ ★ ★

HERTZ RENT A PLANE SYSTEM, INC., begins service to individuals or groups on a "Taxiplane" (charter) basis with pilot provided, or to qualified pilots on a "Fly-Yourself" basis. Joseph J. Stedem, executive vice president, said, "Business flying, particularly, has great potential." He estimates volume operation of first year at $4-million. Reservations now available at 1,500 offices.

★ ★ ★

PIPER COMANCHE flies to Europe for Brussels World's Fair, then to Hanover Fair in Germany, via Miami-Bermuda-Azores and Lisbon, equipped with 146-gallon auxiliary tank in the cabin in addition to 60-gal standard tankage.

★ ★ ★

BECHTEL CORP. (NBAA) of San Francisco has been selected as the architect-engineer for the nuclear reactor to be constructed at Hallam, Neb., under cooperative arrangement with the Consumers Public Power District of Nebraska.

★ ★ ★

MEXICO BORDER PATROL has taken delivery of two specially equipped Piper PA-18 Super Cubs. Immigration Naturalization Service, U.S. Dept. of Justice, uses planes equipped with loud speakers for direct voice communication from plane to persons on the ground.

★ ★ ★

UNAUTHORIZED USE OF PRIVATE RADIO FACILITIES for instrument letdown, approach or other IFR navigation, subject of strong caution by NBAA (Feb. 2 Bulletin to members). Convenience of VFR use with verbal agreement of owner/operator as mentioned in May Skyways should not encourage dangerous practice prohibited by CAR 60.46 (for clarifying revision, see February issue, "Panic or Panacea?"). Both a contractual agreement with owner/operator PLUS CAA "Letter of Authorization," required for IFR use.

★ ★ ★

HELICOPTER COUNCIL OF AIA reports that ten member companies have 17 different helicopter models in production—the largest being 26-place, 130 mph with 100-mile range, and the smallest being for two persons.

★ ★ ★

AIA REPORTS 1,131 aircraft exported in 1957, totaling $17,372,539, being shipped to 59 foreign countries. Steady advance in U.S. exports reflects world-wide recognition of safety and reliability of our aeronautical products.

Aviation Roundup

CAB STATES "POSITIVE" CONTROL OF ALL AIR TRAFFIC at least five years away in report to Congress last month. If control attempted now, it would ground 85% of nation's air traffic. "Every day 200,000 or more persons fly safely through the airspace over the United States," CAB reports. "High degree of safety of everyday traffic is result of combined contribution of men, money and machinery and the existence of a great natural resource—the airspace," says CAB. On negative side, 90% of the 159 mid-air collisions of past ten years was in clear daylight, within five miles of an airport. In 1957 pilots reported 971 near-hits. The thousands of aircraft in which persons ride are commercial, military and general aviation.

★ ★ ★

BLACKFIELD AERO INDUSTRIES of Oakland Int'l Airport, Calif., now has under construction revolutionary building large enough to enclose three aircraft in single sales room. Long familiar to automobile showrooms, this glass display technique includes lounge flight information for pilots and executives.

★ ★ ★

FIRST U.S. BUSINESS OWNER OF TRAVEL AIR is Lundell Mfg. Co., Cherokee, Ia. Vernon Lundell, manufacturer of industrial and farm equipment, took personal delivery of the Beech model.

★ ★ ★

INTERNATIONAL HOTEL built at $6-million cost by Port of NY Authority at NY Int'l Airport. Operation under lease by Knott Hotels, providing much-needed guest rooms ranging from single to executive and VIP styles. Space age theme dramatic theme for decor and design allows for increase in size later.

★ ★ ★

FAIRCHILD F-27, first U.S. twin-propjet airliner, completes successful maiden flight. Deliveries begin this month. Thirteen major corporations ordered for executive flying operations, including: Continental Can, General Tire & Rubber, Butler Aviation (Washington), Bank of Mexico, Westinghouse Electric, Ideal Cement Co., Champion Spark Plug and Kimberly-Clark. The new era of jet age transportation for business is here.

★ ★ ★

OAKLAND AIRMOTIVE (Calif.) announced successful completion of structural "fail-safe" tests for pressurization of Lockheed PV-2 conversion called the Centaurus." This pressurized business aircraft makes it possible to hold cabin pressure of 8,000-ft at actual 18,000-ft altitude. Adds approximately $150,000 to the customer's cost. (See May Skyways, page 37.)

★ ★ ★

NARCO INAUGURATES NEW WARRANTY SERVICE program for purchasers. This new program recognizes that electronic equipment must undergo period of shake-down and "debugging." Once a piece of equipment gets over the first 25-50 hours it usually gives reliable operation for long periods.

★ ★ ★

DATELINES . . . June 14, Air Mail Pioneers, 40th Anniv. Ball, Beverly Hilton Hotel, Beverly Hills, Calif. . . . June 24-26, Aviation Distributors and Manufacturers Assn., Mount Washington Hotel, Bretton Woods, N.H. . . . July 4-8, All-Woman Transcontinental Air Race, San Diego, Calif., to Charleston, S.C. . . . July 16-22, Jaycee Air Cruise, Philadelphia, Pa., to Mexico City.

DARE DM-3

TRANSISTORIZED MARKER BEACON RECEIVER

A unique transistorized circuit gives the DARE DM-3 tremendous advantages over ordinary marker beacon receivers. All moving parts have been completely eliminated. Dynamotors, vibrators, relays all have given way to the more efficient, more reliable transistors. Result: a sensitive, compact, light-weight receiver you can always rely upon. See it today at your DARE distributor.

Visual-Aural Indication

Operates external 3-light indicator. Simultaneous audible and visual signal with minimum signal input.

Light Weight

Only 5.9 pounds, including power supply. Fits ¼ ATR short length rack. Modular construction for easy servicing.

Sensitive, Crystal-Controlled Circuit

Assures receiving the desired signal without interference from unwanted signals. Requires only 1 ampere at 27.5 volts, or 2 amperes at 13.75 volts.

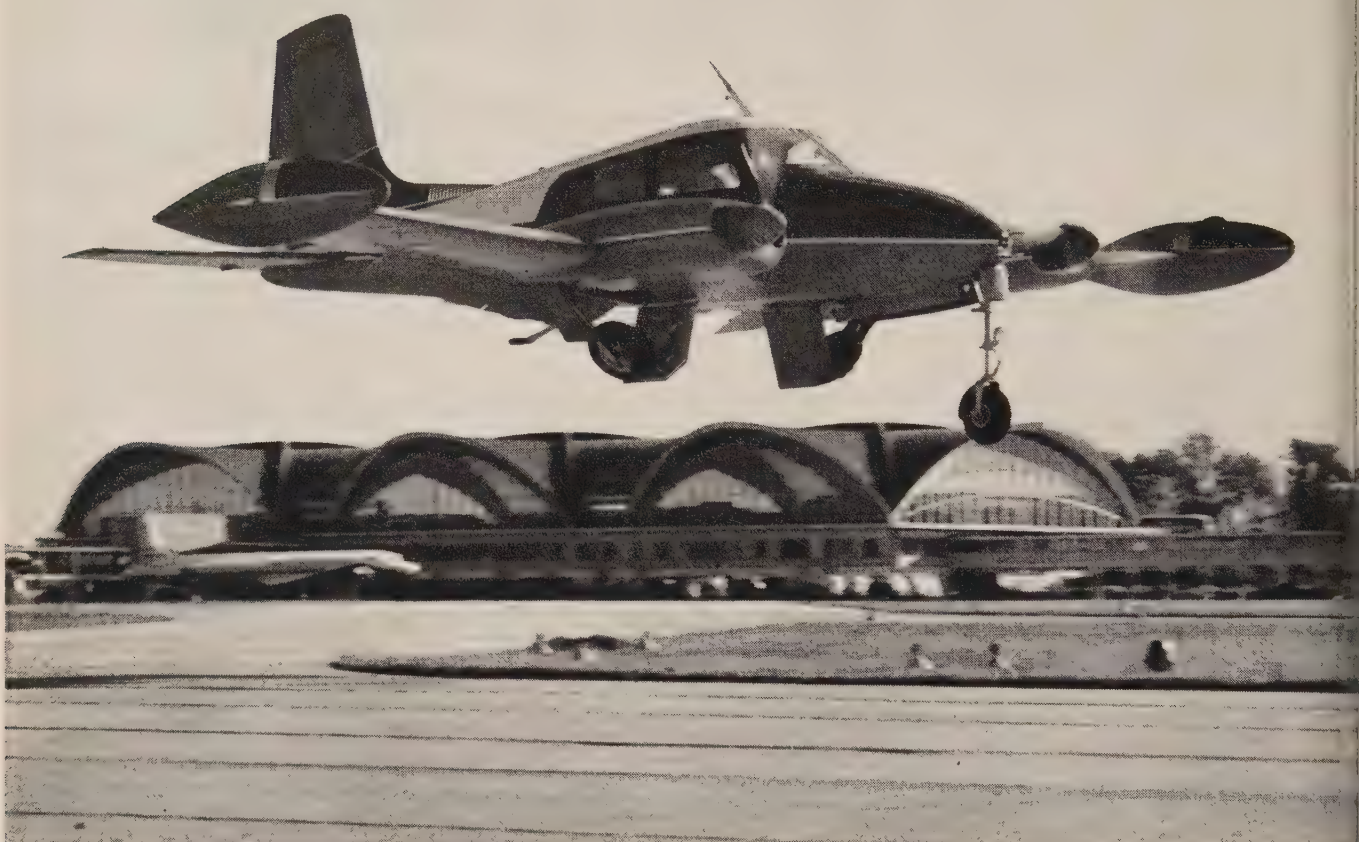
Meets CAA-TSO C-35 Requirements

DARE INC.
TROY, OHIO

Manufacturers of a Complete Line of Aircraft Communications and Navigation Equipment

Circle No. 7 on Reader Service Card

MEET THE WBAALT*! NEW CESSNA 310B



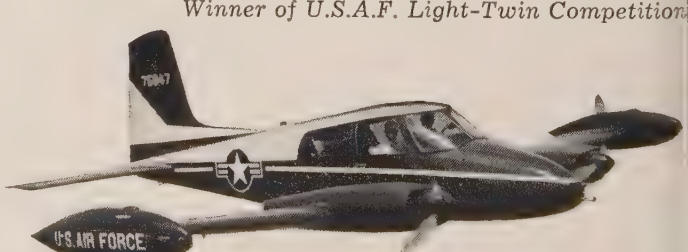
NEW, FASTER CRUISING SPEED

. . . and faster single-engine climb than any other business twin

Look at the new, higher performance you get from the world's best all-around light twin! Cruising speed: 213 m.p.h., 70% horsepower at 8,000 feet . . . high-speed power to climb 415 feet per minute on *one* engine while fully loaded with 5 passengers. It's the great new Cessna 310B!

More advanced design is a major reason for the 310B's top performance. Its tip-tanks channel air flow, increase control as well as speed. Its flat engine nacelles are a mere 21 inches high, reduce air resistance, actually add lift. Retractable landing gear and split-type flaps, broad-span tail group, and 69% of weight below and forward of passengers increase speed, stability, safety. Also highly important: the 310B's two performance-proven, 240-h.p. Continental engines. More advanced design shows up again in Cessna's new, quieter, larger interior—the revolutionary "Comfort-Sealed" cabin. Price of the new Cessna 310B: $59,950 f.a.f. Wichita. Call your Cessna dealer (Yellow Pages of phone book) or write CESSNA AIRCRAFT COMPANY, Dept. S-26, Wichita, Kan. Inquire about Cessna Lease Plans.

**World's Best All-Around Light Twin—Winner of U.S.A.F. Light-Twin Competition*



Cessna

6 GREAT CESSNAS 172 175 180 182 SKYLANE 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED

Circle No. 18 on Reader Service Card

THE FACTS OF "LIFE"

I Learned About "LIFE" From Lear

by Herb Fisher

Bill Lear invited me to witness LIFE in a cockpit! Being his usual accommodating self, he said, "You can fly LIFE (Lear Integrated Flight Equipment) in our Aero Commander in the New York area and in my Twin Beech in Santa Monica. Since these are two of the heaviest air traffic centers of the country where life is roughest for the all-weather pilot, LIFE can best demonstrate easier IFR flying with the potential for lower minimums in all high density traffic areas."

I spent an entire day looking over Bill's extensive production and installation facilities in Santa Monica, Calif.

On the way to the flight line the following day, I met three of his engineering pilots, Sam Auld, Bob Mays and Joe Rau. A credit to the organization, they combine excellent pilot ability with thorough technical knowledge.

Bill said, "*You can bet your life on LIFE!*—it's got that reliability you've always dreamed about—and it's most natural to fly, too!—IFR approaches down to the lowest minimum visibilities are a cinch—no confusion when the chips are down. You'll have the greatest peace of mind on IFR you've ever known." Then we flew it, and he proved it.

Bill briefed me on the instruments.

"The upper (command) instrument on the panel (Fig. 1) gives attitude presentation, 360° roll and 70° pitch angle. This is a moving aircraft type of presentation, which is different from the moving horizon in that the aircraft symbol within the instrument rolls in the same relation as the aircraft rolls. That is, if you roll the aircraft to the right, the symbolic aircraft goes to the right. Even more important, I think, is the little index up at the top of the instrument which gives heading indication and angle of bank also in correct relationship with the rolling of the aircraft. Consequently, nowhere along the way do you have a backwards presentation. In all instances, it rolls the way that you move the controls, minimizing training because of the natural type reaction. With the moving horizon type of instrument, the angle of bank index goes in the reverse of the direction of turn," Lear explained to me.

"Within the same instrument is a moving azimuth card, allowing you to read your heading under the index at the top. This gives you "one-area vision," where you have not only your attitude but also your heading.

"In the upper instrument is the heading pre-select 'bug' which is adjustable, giving pre-select heading information both for the Integrated Flight Equipment and for the autopilot.

"Another function in the upper instrument is the glide slope indication, represented by diamonds at the wingtips of the aircraft. When those diamonds are not activated for approach purposes they remain fixed in the level horizon position; you plot the symbolic aircraft to the diamonds for straight and level flight. When they are being used in the glide slope, you still fly to the diamonds. This brings you down the glide slope. In all instances in this instrument. both your steering 'bug' and your glide slope 'bug' are always used for the same function. They never have to disappear from the face nor is there a time that you ignore them. In every mode of operation, you always fly the aircraft to the diamonds and the index to the steering 'bug' or pointer. The steering pointer in the integrated mode gives just the angle of bank that it takes to bring you back in to the selected course.

"In the same instrument, there is also a gyro flag that falls if the gyro were to fail.

"The lower instrument (Fig. 2) is your Situation Display Indicator which also has a moving azimuth, as well as displacement needles for the glide slope and localizer. The localizer needle is also used as your VOR needle. This is integrated to your course; and this you set in by the course index arrow and the course setting knob, giving a situation display.

"This instrument has three flags—one for glide slope, one for localizer and one for gyro, which represent each when

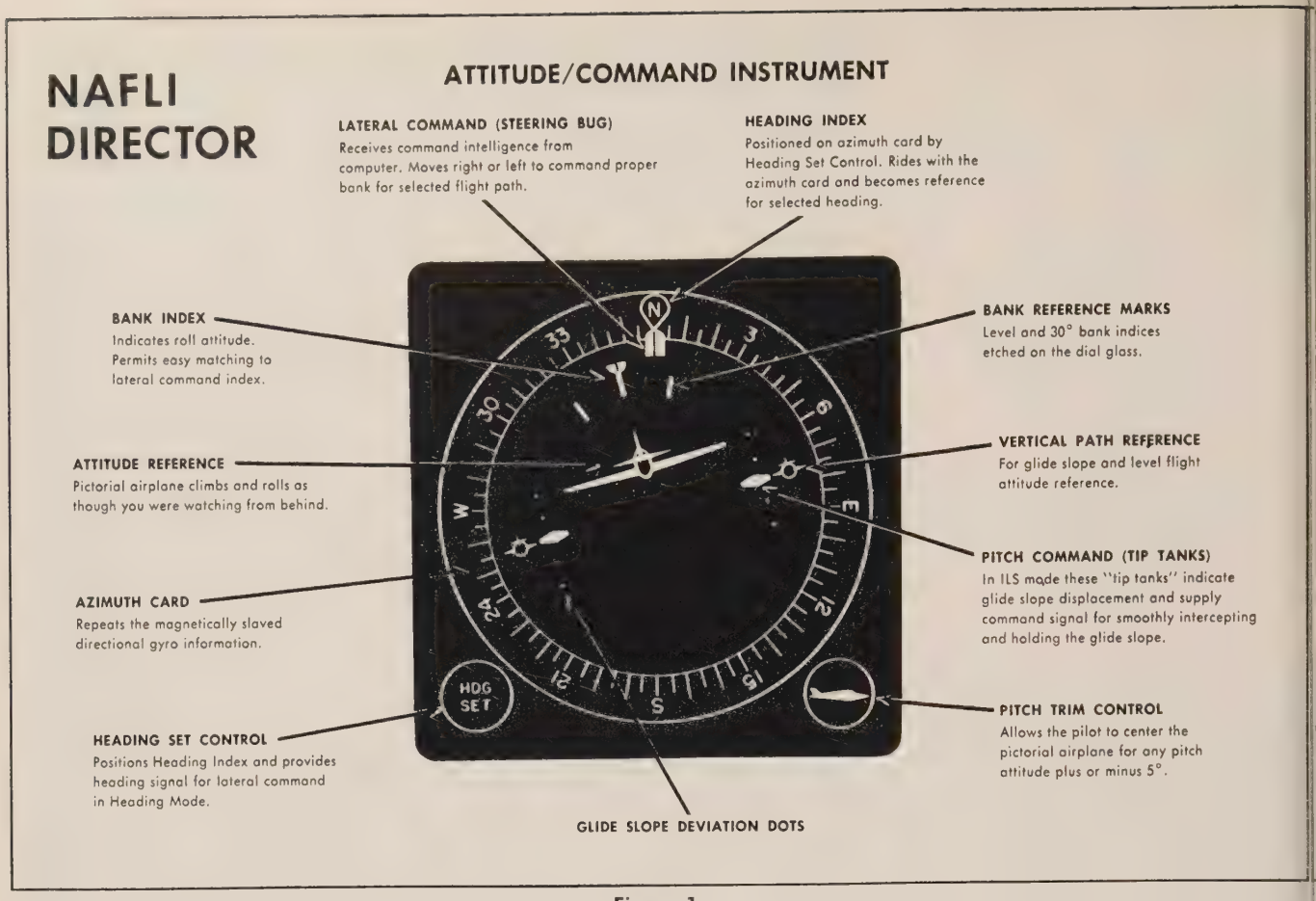

NAFLI DIRECTOR
ATTITUDE/COMMAND INSTRUMENT
LATERAL COMMAND (STEERING BUG)
Receives command intelligence from computer. Moves right or left to command proper bank for selected flight path.
HEADING INDEX
Positioned on azimuth card by Heading Set Control. Rides with the azimuth card and becomes reference for selected heading.
BANK INDEX
Indicates roll attitude. Permits easy matching to lateral command index.
BANK REFERENCE MARKS
Level and 30° bank indices etched on the dial glass.
ATTITUDE REFERENCE
Pictorial airplane climbs and rolls as though you were watching from behind.
VERTICAL PATH REFERENCE
For glide slope and level flight attitude reference.
PITCH COMMAND (TIP TANKS)
In ILS mode these "tip tanks" indicate glide slope displacement and supply command signal for smoothly intercepting and holding the glide slope.
AZIMUTH CARD
Repeats the magnetically slaved directional gyro information.
PITCH TRIM CONTROL
Allows the pilot to center the pictorial airplane for any pitch attitude plus or minus 5°.
HEADING SET CONTROL
Positions Heading Index and provides heading signal for lateral command in Heading Mode.
GLIDE SLOPE DEVIATION DOTS
HDG SET

Figure 1

there is a failure. Another good feature from the failure standpoint in this instrument is,—if you lose part of the system, *you don't lose the rest of it.* In other words, the computer is divided into three separate sections: roll, pitch and yaw. If you lose roll, you still have pitch and yaw. This is a safety feature built into this instrument.

"In order to operate this on VOR, tune in the desired station, select the desired course on the lower instrument (Fig. 2), and fly to match up the 'bugs' on the upper instrument. Set your Mode Selector containing Attitude, Heading, Capture and Hold, in the Capture position. The 'bugs' give you your proper intercept course. Set in the Hold position, it throws in wind integration. For ILS, you tune in the ILS, then set the Course Selector to the ILS course, then select the Capture mode. This automatically brings you on the ILS course at which time you actuate the hold button which corrects for cross-wind. Then you merely follow the steering 'bug' and glide slope diamonds down to a landing.

"One of the many features is that when operating on the autopilot, if the autopilot for any reason leaves the system by failure or disconnect, the little steering 'bug' at the top of the upper instrument (Fig. 1) springs over to pick you up at your present attitude and lead you through the function that you have commanded the autopilot to perform.

"Within the computer, the servo amplifier modules are constructed so that they plug in with one screw and are identical for all three axes of movement. This means two things: one, that you only need within your parts supply line one module for all three functions, and two, that they are interchangeable from one to the other so that if you were to have trouble away from a parts supply service, you could pull out one that you need least (or can best afford to be without), and you could put this in one of the other module places,—or carry a spare with you."

On our initial take-off from Clover Field, Santa Monica, Radar Departure requested that we maintain 210° for one minute and then turn to 250°, which took us well out over the ocean, and climbed until we were 1,000 ft. on top. The boys had told me how easy it is to fly LIFE when you tie in the L5 autopilot. Immediately after take-off and the first power reduction, I snapped on the autopilot and turned the heading selector to 250° and climbed through 3,000 ft. of overcast, broke out on top, and reported as required by Radar Departure. I turned towards Downey Fan Marker and requested our Number 1 instrument approach to Los Angeles International Airport. At this point I decided to disengage the autopilot. This action made me realize what a really fine precision job the autopilot does. Numerous approaches were made manually on the LIFE, and I can say that the presentation of the command instrument gives all the information the pilot needs to execute a precision approach manually with the situation display instrument serving as a monitor of his accuracy and precision. We made numerous IFR approaches and it is almost impossible to make a poor approach with the equipment. On every approach, we stayed with the instrument until we were well below 100 ft., where we found ourselves well aligned with the center of the runway.

In the air again, we set the selected course on the Situation Display Indicator (Fig. 2) and engaged the capture mode, then referred to the NAFLI Director and banked our aircraft until the "steering bug" and bank index mated. We kept them mated and rolled out smoothly on course. As we approached Los Angeles International again, we selected the localizer as our new course and flew outbound parallel to this course preparing for our approach.

I was impressed again to note that Lear has taken the conventional heading index from the Situation Display Indicator and placed it on the Attitude/Command Indicator (Fig. 1). This eliminates congestion with the lubber line on the Situation Display Indicator and allows you to read your heading

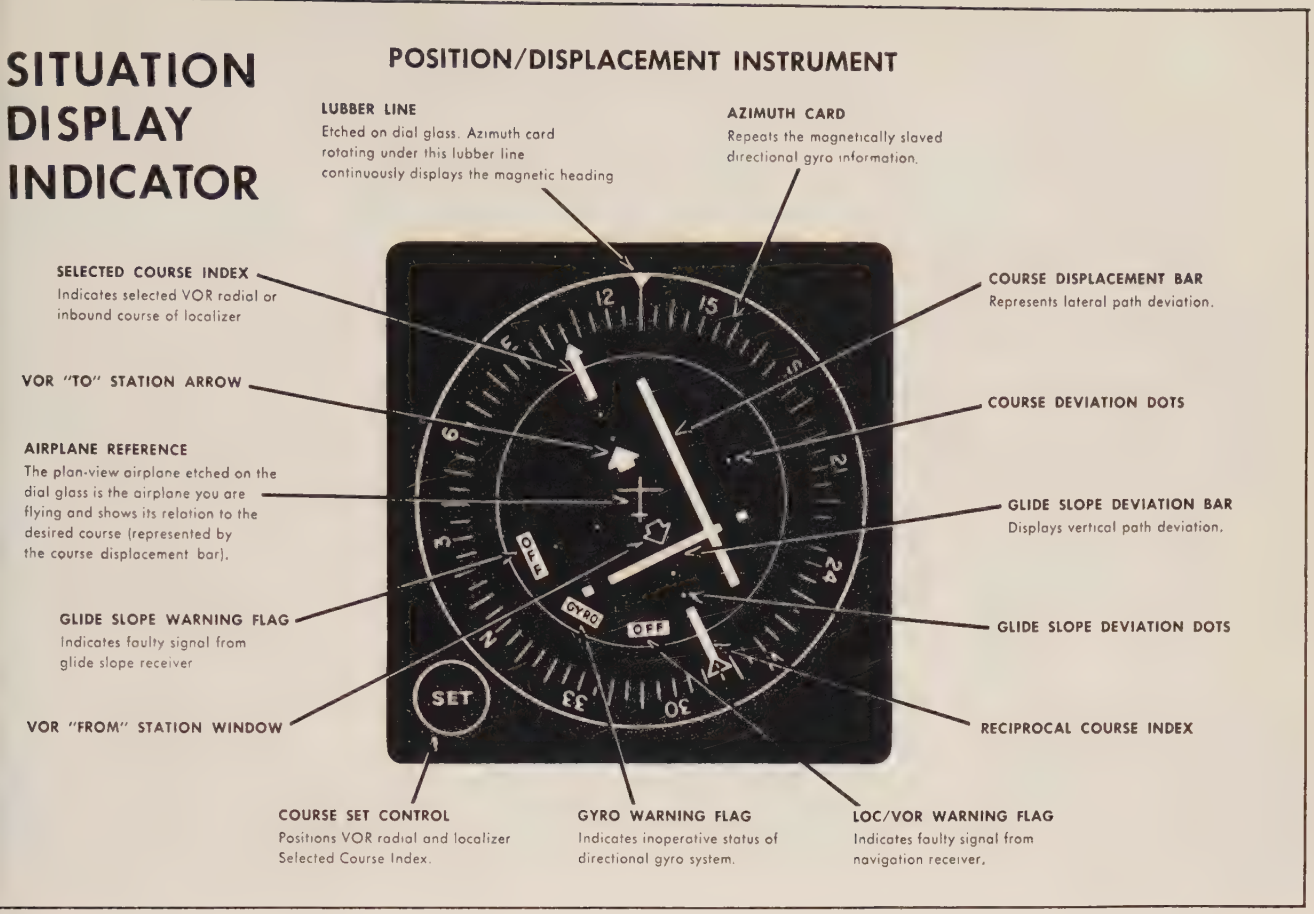

SITUATION DISPLAY INDICATOR
POSITION/DISPLACEMENT INSTRUMENT
LUBBER LINE
Etched on dial glass. Azimuth card rotating under this lubber line continuously displays the magnetic heading
AZIMUTH CARD
Repeats the magnetically slaved directional gyro information.
SELECTED COURSE INDEX
Indicates selected VOR radial or inbound course of localizer
COURSE DISPLACEMENT BAR
Represents lateral path deviation.
VOR "TO" STATION ARROW
COURSE DEVIATION DOTS
AIRPLANE REFERENCE
The plan-view airplane etched on the dial glass is the airplane you are flying and shows its relation to the desired course (represented by the course displacement bar).
GLIDE SLOPE DEVIATION BAR
Displays vertical path deviation.
GLIDE SLOPE WARNING FLAG
Indicates faulty signal from glide slope receiver
GLIDE SLOPE DEVIATION DOTS
VOR "FROM" STATION WINDOW
RECIPROCAL COURSE INDEX
COURSE SET CONTROL
Positions VOR radial and localizer Selected Course Index.
GYRO WARNING FLAG
Indicates inoperative status of directional gyro system.
LOC/VOR WARNING FLAG
Indicates faulty signal from navigation receiver.
SET
OFF
GYRO

Figure 2

t the lubber line. Lear has made this possible by designing n azimuth card on both indicators, and also providing three xes data on both indicators.

We were ready to turn onto the localizer course and begin ur approach. The course was already set into the indicator o we engaged the capture mode and referred to our NAFLI Director to establish our proper bank to roll out on the ourse.

When the Lateral Command "steering bug" and the bank ndex were in a vertical position on the NAFLI Director, we vere inbound on the localizer course. As we headed into a eavy overcast, I learned that Lear's answer to a compass ailure is definitely more than a warning flag. This was dem- nstrated by *disabling the compass system* during this ap- proach under instrument conditions. We pulled out the ourse set control to the second position, permitting manual ontrol of the azimuth card. We continued our approach lown the glide path with deviation. We also demonstrated n approach using the cross-pointer of the Situation Display ndicator, which actually proved an instrument approach with the loss of the gyro compass system.

To complete our final approach, we reactivated the com- pass system to take advantage of the simplicity of the Atti- tude/Command Indicator. Thus, *the flexibility of the LIFE system contributes considerably to its reliability.*

* * *

Upon return to the New York area, I had the opportunity to test the system again under the expert guidance of pilot Ed Drake, transport sales manager. We exposed it to all phases of professional requirements on a full IFR plan in a very high density area. Unfortunately, the day turned out to be almost CAVU, so a simulated operation, employing a full IFR plan was necessary.

Examination of the "Jep" charts suggested that a route around the New York Terminal area South and East to Riverhead on V-16 at the minimum en route altitude would impose the most severe test on the radio navigational receiving parts of the equipment, and if anything would foul up the computer portion, this should be it.

This figured, we filed the plan with "Teeter Tower" for relay to New York Center at least a half hour in advance to cope with the processing delay associated with their automatic flight plan computer.

We consumed the waiting time by a thorough cockpit check and study of the LIFE system as installed in NAN 13L (Lear's Aero Commander 680).

Our clearance ready, we were asked if we would prefer VFR to Colt's Neck omni in lieu of the lengthy low frequency routing via Paterson and Chatham MH's to Bellemeade and Colt's Neck. We did. However, EWR Departure Radar worked us anyway as we cleared the pattern at TEB, and with a direct routing to COL VOR, they gave us lots of traffic information (we get awfully uneasy in CAVU these days) and also a radar check on the accuracy of our omni bearing indications.

Suddenly, an unidentified Air Force Packet at our altitude tried to play duckpins with us. I really had to rack it over to give him a zero score, so we got off course. Ed used the occasion to engage the LIFE computer, and we re-intersected the pre-selected track as pretty as we've ever seen with any airborne "think gadget."

"Station passage" is very positive and easy to split when keeping the two "little bugs" in conjunction. We had no problem following the command index "bug" with one hand while copying further ATC with the other. It was a little more jittery than we would have liked, but was very easy to follow.

There is certainly no comparison flying an accurate Victor Airway Course with this system as against just an ordinary VOR cross-pointer indicator.

(*Continued on page* 53)

U. S. Patent No. 2,687,102

Night view of L. B. Smith's new 80,000 square foot hangar at International Airport, Miami, Florida. The clear span area is 360 feet long by 80 feet deep. Vertical clearance of 22 feet

Every square foot of hangar space— a square foot of usable space

Cantilever type construction means no obstructions of any nature to interrupt the clear span space, providing perfect housing for the maintenance and storage of aircraft. Enclosed space to the rear is spacious area for workshops, parts and office facilities.

This advance design is the result of 17 years experience in building several hundred hangars, of all sizes and types, which have withstood the most exacting load forces of every area—from the heaviest snow loads of the north and east, to the hurricane wind forces of the coast and the earthquake shock loads of the west.

Consult us before you build a hangar of any size, as this new modern cantilever type building can be constructed to your exact needs and in most cases will cost no more than older fixed span or limited clearance designs.

Call, write or wire us for information

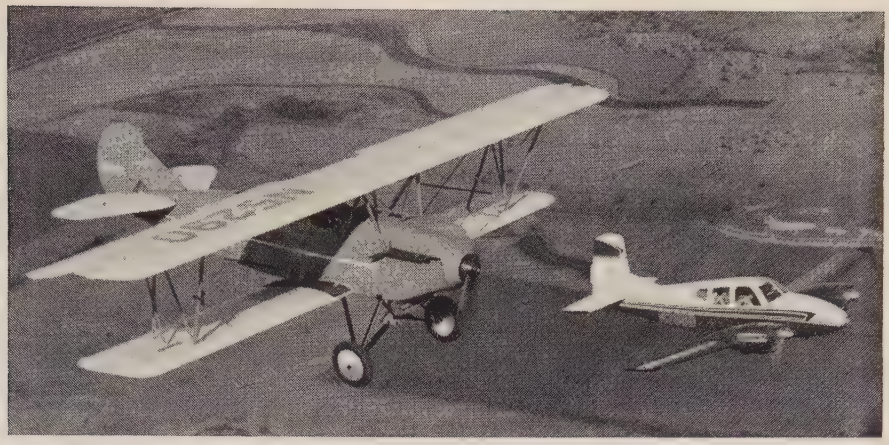
- Single Cantilever
- Double Cantilever
- Facing Cantilever

Erwin Newman Co.

Designers and Constructors

- Any Height
- Any Length
- Any Depth

Circle No. 9 on Reader Service Co



MODERN TRAVEL AIR

LOW WING, TWO ENGINES

by Raymond Wood

From the factory people I heard the familiar party line—that the new Beechcraft Travel Air was the "most" in a twin-engine airplane. Chanting every hard-sell phrase in the book, plus a few never before told, they heaped glowing words of praise upon Travel Air handling qualities, performance, comfort and economy. But I'm a skeptic by nature, and, like the guy from Missouri, I must be shown.

L. L. (Hook) Gaston, commercial Travel Air sales manager, introduced me to his bread and butter. My first impression was that here's a Bonanza with two fans and conventional tail. I was partly right, for the Travel Air, designated Model 95, embodies design criteria, construction and components of the Bonanza, Twin-Bonanza, Mentor (USAF and Navy trainer) and Super 18.

Engineering studies indicated that by utilizing many existing parts available from its other models, Beech could produce a plane competitive with other twin-engine makes below the Twin-Bonanza weight and power class. More than 70% of Travel Air parts are interchangeable with other models and some 80% are very nearly identical. Gomer Jones, Model 95 project engineer, told me that every major structural part and component had been tested to strengths of at least 39% above CAA requirements, making the Travel Air the most rugged business airplane in its category.

FLIGHTING *the Travel Air are Herb Fisher, left, Skyways test evaluation pilot, and Gene Larimer, Atlantic Aviation. With Larimer, Fisher also flew the plane and agrees with Wood's report.*

Use of parts already in production eliminates much expensive tooling which would be required of a completely new airplane. As a result, Beech is able to market the Travel Air at a basic list price of $49,500. But so much for development. I was itching to get into the air.

We started by making the walk-around and pre-flight inspection, easily done due to the "just below eye level" of most of the things a pilot should check. Props, engines, fuel caps, movable surfaces, hinge pins, antennas and all exterior skin are easily and quickly inspected. There's also easy access to tires, brakes and windshield.

Convenient entry to the plane is like a Bonanza. Although the attractive cabin interior has Bonanza dimensions, it gives one the impression of being roomier. Seats are comfortable and, having logged considerable Bonanza time, I immediately felt right at home in the Model 95.

Hook gave me a cockpit checkout, and it was a real pleasure starting the two 180 hp Lycoming engines. Mixture controls off, throttles slightly open, master switch on, both mags on and press the starter button. When the engine starts, move mixture controls full rich.

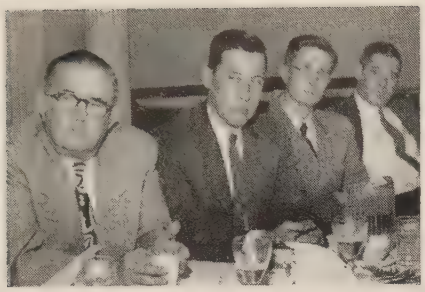
Switches and starting procedures were simple to master, and I felt there were no "booby traps" in the control arrangement that could get complicated as flying commenced. As we moved out to the runway I found the airplane very easy to taxi with minimum engine power.

With full 112 gallons of fuel aboard, Gaston and two of my over-sized associates who went along for the ride, plus some special test equipment stored in front and rear luggage compartments, we were very near the plane's design gross weight of 4,000 pounds. Being conservative, I didn't try to make the shortest possible takeoff, but with 10 degrees of flap it accelerated rapidly and broke ground in 800 feet at 71 mph indicated.

I held the nose level until we hit 80, then retracted the gear. Four seconds later the gear was up, and we were doing 100. I climbed out at 1,000 fpm at about 130 mph. When we reached 5,000 feet I leveled off and did a series of steep turns, banks and shallow dives. The more I flew, the more pleased I became with its handling characteristics.

Next, I tried stalls. First I set power at 15 inches manifold

(Continued on page 54)



INTENT LINE-UP, *from left, George Pomeroy, W. J. Ort, Ted Wild, B. H. Gale.*

AMUSED INTEREST *by Clifford Hudder, Dallas Airmotive; J. R. Church, AC. (r).*

AIRCOOLED'S *V. J. Mecca (l); L. P. Haxby, Shell Oil; J. M. Shimek, AC, (r).*

SHELL OIL'S *R. P. Foster; J. M. Shimek, AC (l); E. G. Balogh, Titeflex (r).*

CHAMPION'S *R. L. Anderson (r); L. C. Smith, C-W; J. L. Rhodes, Atlantic Av. (l)*

SKYWAYS FLIGHT OPERATIONS ROUND TABLE

April 1958 *Wings Club, New Yo*

SPARK PLUG AND IGNITIO

• Even with reasonably good fuel blend calculatio you can't be sure what octane number is going in your equipment except by measurement.—Haxby

• Use of higher leaded fuels by persons lacki enough experience and background has brought erational and blame in the field.—Anderson

• If domestically a fuel grade is dropped, it wou probably be 91 grade.—Foster

• By going to "all-weather" harness and plugs, t twin engines will eliminate 70% fouling.—Shimek

• Helicopter operation is more severe on the engi and the ignition system components.—Anderson

• Development of engines has kept pace with deve opment of fuels. As fuels become better, we are ab to produce better engines.—Smith

• Since fouling comes partially from deposits, he range is very important.—Haxby

• Thermocouple spark plugs tested on an airplane active service will tell us exactly what is happeni within; then a spark plug can be tailored to me those conditions.—Smith

• Gap wear of spark plugs is major concern to pla operators and engine manufacturers. Pulling of spa plugs at an odd interval is very costly.—Church

• We've never specified maximum plug gap. As lo as the engine is running satisfactorily, we don't ca what the gap is. You can always go higher in octa fuel, but never lower.—Smith

NEL MEMBERS *standing, (l-r) R. P. Foster, J. R. Church, A. E. ssett, J. M. Shimeck, J. L. Rhodes, L. C. Smith, Ted Wild, L. Anderson, Hermann Waker, L. R. Musacchio, J. R. Ingram, P. J. Landi, G. C. Pomeroy, W. J. Ort, B. C. Fisher. Seated, (l-r) V. J. Mecca, L. P. Haxby, E. G. Balogh, E. P. Kovac, William S. Campbell, Robert McClintock, B. H. Gale, and Clifford Hudder.*

Operational Characteristics Discussed By Leaders and Users

The reciprocating engine is going to be around for long time. There is a benefit the small aircraft engine can inherit from experience on larger engines ith the 3/4-20 spark plug.—Anderson

Detonation is backfiring, or spontaneous backburning in combustion chamber. Pre-ignition occurs when onditions produce enough heat to give a spark. This ives you a loss of power.—Foster

A properly reconditioned plug will give completely tisfactory service; there is no reason why it should ot be used.—Anderson

A spark plug cannot cause detonation. It can cause re-ignition. Detonation is a destructive force that can urn holes in pistons and crack spark plugs. It can ut the engine into pre-ignition.—Smith

We set no repair or cleaning time limit for spark lugs. Depends entirely on condition. Testing in the ngine isn't the same as testing in the shop. Shop ethods are compromises, not equivalents.—Anderon

The engine analyzer should be constantly observed be useful; don't wait until trouble occurs before ooking at the analyzer.—Kovac

Platinum electrode plug is losing identity as fineire plug as size increases to meet needs of newer igh-powered engines. Trend to finer abrasives for dry leaners is being kept in mind.—Anderson

. S. Campbell (*Scintilla Div., Bendix Aviation*), **Moderaor:** First topic is "Octane of fuel—effects and necessities of ame." Mr. Haxby, will you start the discussion?

L. P. Haxby (*Shell Oil Co.*): Well, Bill, we don't have to explain that octane of fuel is a necessity. On aviation fuels in particular, we are tied very closely to military specifications. It means we do not have to manufacture fuel for each individual operator's specifications. This is to the engine manufacture's advantage also. They don't have to tailor an engine for a given fuel or an individual engine operator. The light aircraft engine manufacturers have recently taken advantage of the higher rating fuels available to raise the performance of their engines. Four grades of fuel—80, 91, 100 and 115—are available, making possible a selection of fuels for various operating conditions. These fuels by grade are all pretty standard. At present, there is no anticipation of offering additional grades.

R. P. Foster (*Shell Oil Co.*): Can I make a correction to that? There are five grades. We are trying to phase out one, 108/135.

Haxby: Pratt & Whitney has recently re-rated some of their engines that were previously rated on only 108 grade; they have now rated these engines on 115 grade fuel. The operator now has a choice of operating on either 108 or 115.

L. R. Musacchio (*CAA*): You mentioned only the low points of fuel. I was under the impression that with the addition of bromide additives to petroleum products you were considering going to a higher grade than 115-145.

Haxby: This is a mutual venture between the petroleum company, the engine manufacturer and the operator. For example, Wright Aeronautical is very interested in obtaining increased performance number of fuels. We are also interested in this if it can be a mutual venture. Increased performance number fuels cost us more to produce. This means, in due course, it will cost the operator more money. If the operator can achieve a greater net back by spending more money, he will do so. Then, in time we can provide increased performance number fuels for him. If he can not achieve a proper net back that offers an incentive for going to higher performance number fuels, chances are by basic economics,

MODERATOR

WILLIAM S. CAMPBELL, assistant service manager, Scintilla Div., Bendix Aviation. Studied mechanical engineering at Drexel Institute, and graduated from the Rising Sun School of Aeronautics. Formerly was in Naval Aviation.

PANEL MEMBERS WHO PARTICIPATED IN THE ROUND TABLE DISCUSSION

VINCENT J. MECCA, service manager, Aircooled Motors, Inc. With Aircooled since 1945 as technical representative and asst. to chief engineer. He holds private pilot license since 1946.

BERNARD C. FISHER, research eng., Neutronic Development Co. With Arco-Marine Corp. for many years. Is co-originator with T. Fokker of AirTransport. Presently doing research on spark plugs.

E. PAUL KOVAC, senior service power plant engineer, Lockheed Aircraft Service, International. Graduate of N.Y.U., B.S. in Mechanical engineering. Formerly was associated with American Airlines as power plant engineer.

B. H. GALE, mgr., Newark branch, Airwork Corp. During WWII in Navy, specializing in fire and carburetor systems. Was with P&W carburetor test lab. Assisted in organization of Accessory Division, Airwork.

TED WILD, supt. of maint., Union Carbide Corp. Has been plant mgr. Central Aviation, maintenance supervisor for Air France, mechanic with TWA, Aviation Inst. of Tech. instructor and flight eng. instructor in the U.S.A.F.

PHILIP J. LANDI, heliport supervisor, Port of New York Authority. Graduate of the Spartan School of Aeronautics and Fairleigh-Dickinson Univ. of Aviation. He holds private pilot and helicopter ratings, A & E license and is a member of the Helicopter Society.

GEORGE C. POMEROY, vice president, Swiflite Aircraft, Cities Service Oil Co. His long aviation career began as army pilot in WWI, later as air mail pilot. 1934-1942 he served in U.S. Air Service in Pacific. Was voted vicepres. of Swiflite in 1956. Holds pilot's ATR 990, is USAFR Lt. Col., ret.

E. G. BALOGH, engineering consultant, Titeflex Inc., Springfield, Mass. Graduated with BSME from Carnegie Institute. Previously with Wright Aero. A member of both SAE and ASM.

JOHN R. INGRAM, power plant engineer, American Airmotive Corp. Was associated with PAA in the engine and overhaul depts., and has been at Airmotive since 1948.

L. P. HAXBY, Senior aviation engineer, Product Application Dept., Shell Oil Co. Has held many jobs with Shell including work in various flight trials with USAF concerning TCP performance in the B-36 aircraft.

ALLISON E. GOSSETT, assistant director of aviation sales, AC Spark Plug Div., General Motors Corp. Was WWII naval aviator, and flew various prop and jet-type planes. Was with Hiller Helicopters for five years.

JOSEPH L. RHODES, manager, Service Dept., Atlantic Aviation Corp. Has been with Atlantic 13 years. Is vice president of National Aviation Trades Association, and co-chairman of NA maint. council. Was a naval pilot during WWII.

JOHN R. CHURCH, director of aviation sales, AC Spark Plug Div., General Motors Corp. Started with AC in 1940 and has been merchandising mgr. of aircraft products. Member of Aero Club of Michigan and American Helicopter Society, NBAA, ADMA.

HERMANN WAKER, Jr., sales & service manager, Aerodex, Inc. Has held important positions with Wright Aeronautical and Curtiss-Wright. Was administrative assistant to vice president of Pacific Aviation Corp. Is a member of Wings Club of Miami, Fla.

R. L. ANDERSON, aviation service mgr., Champion Spark Plug Co. In commercial aviation since 1928. Prior to Champion, was with Chicago Southern Airlines as director of engineering and maintenance.

CLIFFORD HUDDER, representative, Dallas Airmotive, Inc., Marine Air Terminal, Flushing, N.Y. Is retired from position of Chief, Coast Guard Aviation, Washington, D.C.

L. C. SMITH, service engineer, Curtiss-Wright Corp. Graduate of Univ. of Penn., 1939 and has since been handling fuel metering and ignition problems in service department of Wright Aero. Div.

R. P. FOSTER, technical representative, aviation dept., Shell Oil Co. Received degree in aeronautical engineering from Rensselaer, and was industrial salesman for Shell before present position. Is an SAE member.

ROBERT McCLINTOCK, airline representative, Scintilla Div., Bendix Aviation. In servicing of ignition and carburetor systems for over 27 years. Is now Scintilla's field repr. concerning airline ignition service problems.

LOUIS R. MUSACCHIO, aero. design evaluation engr., CAA. Holds B.S. from Pratt Institute. Served WWII as pilot in U.S.A.F., is active in reserve. Before present position, was with Curtiss-Wright as development engr. on turbo-compound engines.

WILLIAM J. ORT, supt. of maint., Swiflite Aircraft Corp. Was maint. supervisor, Nat'l Airmotive Corp.; co-pilot-engr, U.S. Dept. of Interior; co-pilot-mech., War Production Board; flight-engr-mech., U.S. Coast Guard; aircraft and engine mech., War Dept., USAF.

JAMES M. SHIMEK, field contact engineer for aviation spark plugs, AC Spark Plug Div., General Motors Corp. In aviation since 1942. During WWII was associated with Pratt & Whitney and served as technical advisor to USAF, for which he received citation. At present, also power plant consultant to GM fleet.

(Continued on page 36)

BUSINESS STICKS TO TIGHT SCHEDULE FOR ADHESIVE SALES

More like a whirlwind than a deliberate business flying trip, the C-3 "Flying Showcase" of Permacel-Page covered 38 cities in 41 days.

Purpose of the fast-paced trip was sales promotion of the company's ticky stuff."

The tight schedule was made up by e pilots of the Johnson & Johnson-ned plane (Permacel-LePage is a bsidiary). Basing the itinerary on a ng-range weather forecast, Alex S. ble, captain, and Edward Liudvinai-, co-pilot, produced the route which ent from Florida to California to nnsylvania.

The fully-instrumented airplane made possible to adhere to the tight sched-e. The DC-3 is equipped with dual endix automatic direction finder, dual llins 51 R Omni, dual 51 V glide ope, Collins 51 V marker, Bendix TA BB VHF, RA 18 C receiver, VHF 21 dual Narco distance measuring uipment, Bendix RDR-1B radar, Lear 5 automatic pilot with approach cou-er and altitude controller.

The idea for the "flying showcase" nversion and use of the airplane was hilip B. Hofmann's, board chairman LePage's Inc., and executive commit-e chairman of Johnson & Johnson. It as the end of last November that Hof-ann outlined his plan to the company xecutive group. March 1, 1958, was e date to be ready.

Re-designing the interior of the DC-3 om the business executive configura-on to a showcase was done by Dyna raphic Displays, Inc. The interior de-gn had to overcome problems of eight and the visual impression of a hodge-podge" of products compressed to a giant tube.

Physical weight of the entire display and products could not exceed that of the chairs, two divans, a radio and some accessories which were removed.

The design work was started in December. The airplane was measured in the hangar; plans were drawn, submitted and approved in January. The DC-3 was not out of service while the fixtures were being built. Construction was done in the company's shop and fitted into the plane later. This took about two weeks.

Hofmann not only chose the DC-3 for his "showcase" plane, but also arranged for the two company pilots, appointed a field sales manager, Gilbert M. Reischmann, a hostess-secretary, Pat McKeen, and steward, Kent Zeilon, to man the ship.

SHOWROOM-BUSINESS OFFICE *in DC-3 is put to practical use by Philip B. Hofmann as he dictates to flying secretary Pat McKeen during stop on LePage's 38-city tour.*

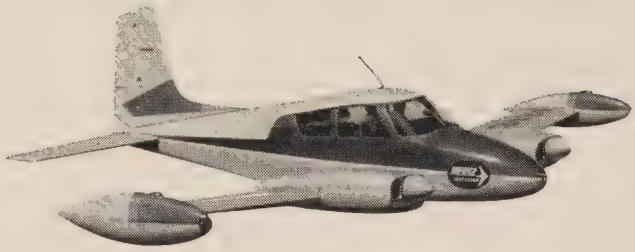
Starting with a sales meeting at Miami, Fla., early in March, the "Flying Showcase" made its official flyaway from Newark Airport, N.J., March 14. States visited were North Carolina, Georgia, Tennessee, Arkansas, Texas, Oklahoma, Arizona, California, Oregon, Washington, Utah, Colorado, Nebraska, Minnesota, Wisconsin, Illinois, Missouri, Kentucky, Ohio, Michigan, New York, Maine, Massachusetts, Connecticut, Wash., D.C., and Pennsylvania.

The total number of buyers entertained during the 13,000-mile trip, which ended May 6, is 1,780.

The 78-year-old LePage name took on a modern aspect when it took to the air in the most modern sense of business aviation.

YOU'VE RENTED HERTZ CARS FOR YEARS—

Now Hertz



Now *anyone* can enjoy the convenience of a private plane. You don't have to be a pilot (or a millionaire) to fly *when* and *where* you want—for a day, a week, a month! You can fly via commercial airline to the major city nearest your destination —save hours by flying the rest of the way in a Hertz Rent A Plane. This check list shows you how easy and economical it is to use Hertz Rent A Plane Service.

Planes shown above: Twin-engine Cessna 310B and single-engine Cessna 172

rents planes!

(WITH OR WITHOUT PILOT)

How do I rent a plane from Hertz?
Call any of the Hertz Rent A Car or Hertz Rent A Plane offices listed in *alphabetical* phone books everywhere.

In how many cities is Hertz Rent A Plane service available?
Presently in over 56 cities across the United States. Service is being expanded. (Franchises are available to reliable established operators in selected major cities.)

How can I be sure of getting a Hertz Rent A Plane when and where I want it?
Your local Hertz office has up-to-the-minute listings of Hertz Rent A Plane services. Your call will assure a reservation.

Do I have to be a pilot to rent a plane from Hertz?
No. Hertz can provide the services of an experienced pilot on its "Taxiplane" Plan.

I am a pilot. What do I do?
On "Fly-Yourself" service, there is a check-out procedure. Apply to any Hertz Rent A Plane office or Hertz headquarters for added details.

$ $ $

How much does it cost to rent a plane from Hertz?
If you are a pilot, the rental rate is as little as $1.50 an hour plus 13¢ a mile. If you require a pilot, rate as little as $2.50 an hour plus 18¢ a mile, plus tax.

Are there lower rates by the day or week?
Yes. In addition to a basic hourly rate—there are reduced rates for daily and weekly rentals.

What is done to assure that planes rented from Hertz are in first class mechanical condition?
Hertz planes are current models. They are regularly inspected and maintained to rigid government specifications as set by the Civil Aeronautics Authority.

Do insurance companies make any distinction in personal life insurance policies between the safety of commercial airline travel as compared to the safety of air-charter service?
No. A survey of leading insurance companies indicates that air travel has established such a good safety record that there are no special policy or premium limitations applicable for either commercial or charter air travel with a CAA certificated operator.

Q. About how much will it cost four of us to fly a 250 mile round-trip (500 miles total) in one day? I am a pilot.
A. In a Cessna 172 a typical daily rate is $18.00 plus 13¢ a mile. Total: about $83.00 or $20.75 apiece.

Q. How much will it cost for three of us to fly a 250 mile round-trip (500 mile total)? We will need a pilot.
A. In a Cessna 172 a typical daily rate with pilot is $30.00, plus 18¢ a mile, plus tax. Total: about $132.00 or $44.00 apiece.

Q. Are planes rented from Hertz fully equipped?
A. Yes! All planes have far more navigational and safety equipment than is required for cross country flying. All are equipped for takeoff and landing at any airport in the United States.

Q. What kind of planes does Hertz provide?
A. Only the finest, new single and twin-engine aircraft, such as Cessna 172's, 175's, 182's, and 310B's are provided by Hertz.

Q. How many passengers can a Hertz Rent A Plane accommodate?
A. Cessna 172, 175, 182 and similar single-engine aircraft—three passengers plus pilot. Cessna 310B and other twin-engine aircraft—four passengers plus pilot.

Q. What are the cruising speeds of Hertz Rent A Planes?
A. Cruising speeds vary by aircraft type and model, ranging from 110 to 190 miles per hour for single-engine planes, up to 235 miles per hour for twin-engine planes.

Q. How can Hertz Rent A Plane service save me time on a long trip?
A. Fly via commercial airline to the major city nearest your destination—save hours by flying the rest of the way in a Hertz Rent A Plane.

Q. Can I arrange to have a Rent A Plane meet me in another city?
A. Yes. A call to your local Hertz office will reserve a plane in most any city.

For further information please write Hertz Rent A Plane, 218 S. Wabash Ave., Chicago 4, Illinois

HERTZ RENT A PLANE

1958 Hertz Rent A Plane System, Inc.

Circle No. 10 on Reader Service Card

- *The illusion of inflation discourages the pur chase of new equipment . . . the facts aren't as ba as they look.*
- *The true cost of an old aircraft may suddenl increase to twice the cost of a new one . . . wit little or no warning.*
- *Residual write-off's raise true cost by 26% o the residual book value . . . this sum cannot be re covered.*
- *Long-term write-off's increase true cost if th aircraft is sold before it is completely written off*

AIRPLANES, MONEY, AND TAXES

by Robert K. Polson

Part II

In last month's "Skyways" (and you should read that first), true cost was based on the original purchase price. But the aircraft which you bought five years ago for $100,000 may now carry a new price tag of $125,000. If you decided to buy, you must pay the additional $25,000 . . . or must you?

The most common theory of inflation is that it affects all things equally . . . through a decrease in the purchasing power of the dollar. Second-hand prices appear to go up in the same proportion as new equipment prices. The relationship between these two may be shown by . . .

$$\frac{\text{Old Equip. Sale Price}}{\text{Old Equip. Purchase Power}} = \frac{\text{Current New Price}}{\text{Original New Price}}$$

or

$$\frac{\text{Old Equipment}}{\text{Purchase Power}} = \frac{\text{Old Equip.}}{\text{Sale Price}} \times \frac{\text{Original New Price}}{\text{Current New Price}}$$

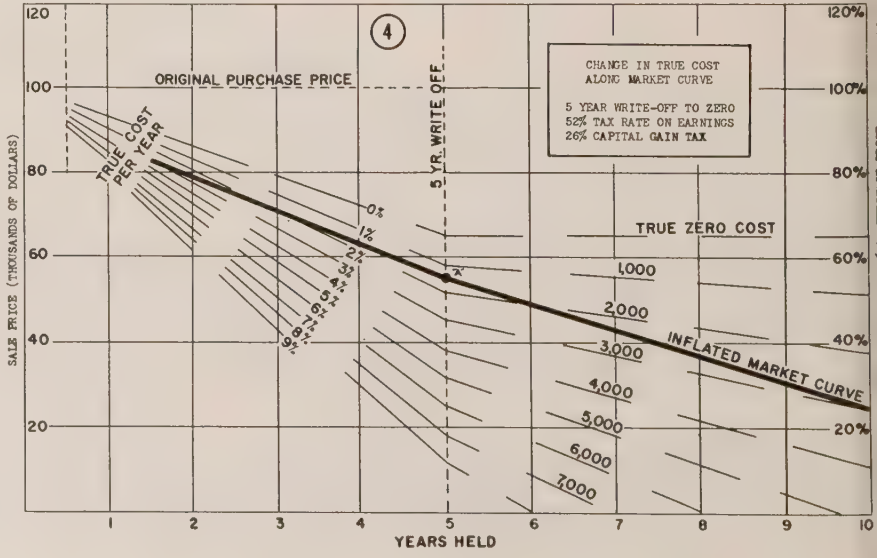
If your old aircraft is now worth $50,000, then the formula shows that its true value (in purchasing power) is only $40,000. This would be its market value if there had been no inflation. If you sell now for $50,000, you will make an apparent profit of $10,000 . . . but you are still $15,000 short of the $25,000 difference in new prices.

The inflation theory also assumes that company profits have inflated in the same proportion. The same effort which produced a $60,000 profit five years ago should produce a profit of $75,000 today. If so, then the remaining $15,000 is already in your pocket . . . the same force which raised new aircraft prices has also furnished you with the money to buy. Whether completely true or not, inflation is, at least, a partial illusion which discourages equipment turnover. The facts aren't as bad as they look.

You must also consider "dollars." The answer here is not an easy one. The innocent-looking market curve in Figure 4 contains a jolting surprise. Point "A," by interpolation between the cost lines, shows a true cost of $1,500 per year, or 1.5% of the original purchase price. If the market for the replacement aircraft behaves like the first one, then you should expect to get by for 1.5% of $125,000 . . . or $1,875 per year. This $1,875 must be compared against the additional cost of your present aircraft *from the fifth year to the tenth.* More specifically, we would like to know *when* this additional cost exceeds the tru cost for the proposed new aircraft. Yo may estimate the additional cost fo each individual year as follows.

The $1,500 true cost at point "A" i an *average* cost over the previous fi years. The *total* cost at that point is 5 $1,500 . . . or $7,500. If you comput the total cost in this manner for e the years along the curve, you wou have . . . .

Year Ending		Average True Cost	Tota True Co
2nd		$3,000	$ 6,0
3rd		2,500	7,5
4th		2,000	8,0
5th	Minimum Cost	1,500	7,5
6th		2,000	12,0
7th		2,320	16,2



2,600	20,800
2,820	25,380
3,000	30,000

addition cost (which we seek) is
ly the difference between the total
at the beginning . . . and end of
year. The cost for the tenth year
t be $30,000 minus $25,380 . . . or
20. If you did this for each year,
could plot the results as in Figure

ne terrific jump in additional cost
s place instantaneously at the end
ie write-off period. The average cost
hese latter years is $4,500 and must
be compared with the $1,875 cost
the new aircraft. Fortunately, this
ease doesn't always happen (see last
th's Skyways for when to "hang
". You have no warning of the
ge in true cost except through your
erstanding of how taxes affect busi-
costs. The weak point is the diffi-
y in forecasting aircraft prices, but
effect of taxes may be much greater
your forecast error. True cost is
ourse only one element in the prob-
You must also consider tax regula-
s, cash position and many other
ors.

ow a change in scenery . . . What
pens to true cost when you don't
e off the entire purchase price?

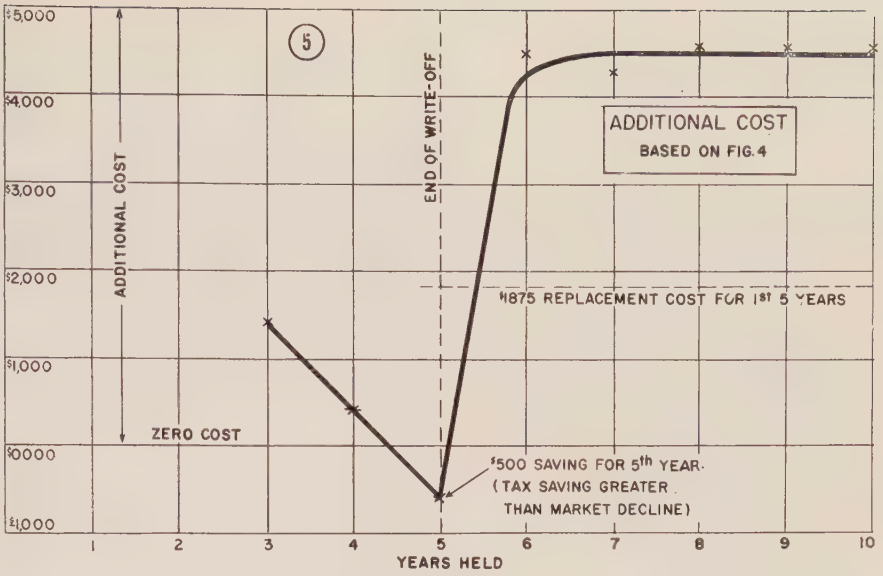
rue cost is actually what's left of
dollar after the effect of taxes is
n out. You have two effects . . . a
tax saving on the amount you write
. . and a 26% *tax* on any capital
you make when you sell. If you
e off to a residual book value, you
the 52% tax saving on that amount.
since there is no capital gain tax
the residual book value, you save
of the residual by paying a lesser
when you sell. The missing 26%
s for taxes. Can you get this back
ou sell for less than the residual
k value?

uppose you bought two identical
0,000 airplanes, depreciated them
a five-year period and then "gave
n away" at some distant time in the
are. You wrote off one aircraft com-
ely . . . the other to a $20,000
dual book value.

nder the complete write-off, you
e no capital gain, no capital gain
Since 52% of the $100,000 write-
would have gone for taxes anyway,
r "tax saving" is $52,000. Subtract
from the $100,000 purchase price
you have a *total true cost* of $48,000.

nder the other method, you'll have
capital loss by giving the aircraft
y . . . $20,000 worth. Let's assume
can merge this with capital *gain*
other equipment. By so doing, you
e lowered the company's total capital
n (on all equipment) by $20,000.
a result, you avoid a capital gain tax
26% on that amount. Your saving
e is 26% of $20,000 or $5,200. So
you're ahead.

But you kept $20,000 on the books,
your total write-off as a business ex-
se was only $80,000. Your tax
ing on this sum is 52% of $80,000,
$41,600. Your overall tax saving
der the partial write-off method is
n $41,600 plus the $5,200 you saved



on your capital loss . . . or $46,800. Subtract this from the purchase price and you have a total true cost of $53,200.

Under the complete write-off, your total cost was only $48,000 . . . the $5,200 difference (which is equal to 26% of the residual book value) cannot be recovered. This is true regardless of whether you wind up with capital gain or capital loss.

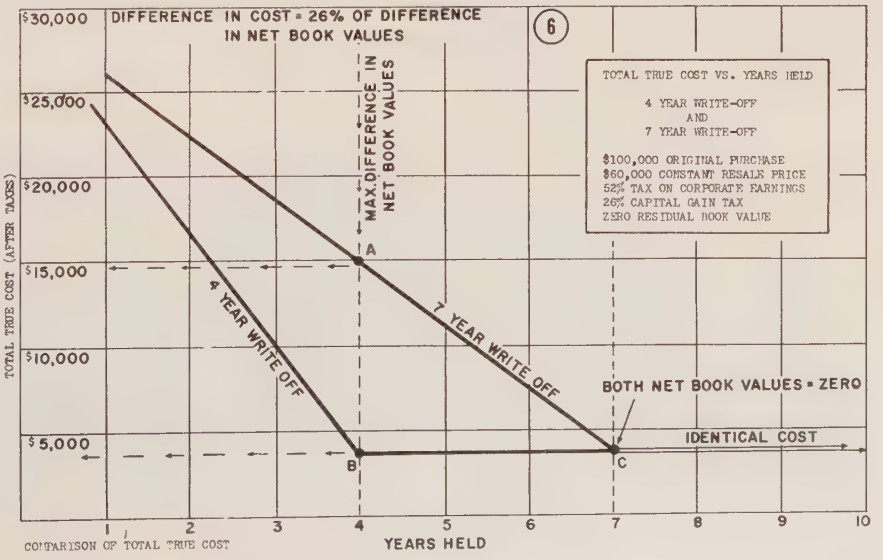
A long-term write-off works somewhat differently. To illustrate, let us again take two identical $100,000 airplanes . . . writing one off in four years . . . the other in seven years. To simplify the problem, we will assume the resale price to be a flat $60,000 for all years. You could graph *total true cost* for both aircraft (see Figure 6.) by means of . . .

$$\text{Total True Cost} = 48\%\left[\text{Write Off}\right] - 74\%\left[\text{Sale Price} - \text{Net Book Value}\right]$$

Point "A" shows a total cost of $14,742 under a seven year write-off . . . point "B" (at the same time) shows a $3,600 cost for the four year write-off. If you sold at that time, the longer write-off would cost you the $11,142 difference (in money after taxes). On the other hand, you would get the *same* cost under both write-off methods, if you waited and sold at point "C." The conclusion is that a long-term write-off increases true cost if the aircraft is sold before it is completely written off. The potential loss is equal to 26% of the difference in the amounts remaining on the books at any certain time (resale price has no bearing on this loss).

In order to get the largest net tax saving (or to protect yourself against an unforseen early sale) you should get as much depreciation on the books as you can. If this is true, why doesn't everyone do it? There are other things to consider. If *too much* depreciation is scheduled over a short period, the stockholders have no dividends for those years . . . and such big dividends in following years that most of it goes for personal income tax. Anticipated taxable income is thus a factor in scheduling depreciation. In addition, the poor earning record (for those first few years) looks bad in case the company wants to raise capital.

Everyone should pay their fair share of taxes. The amount of your fair share may depend on management of depreciation. True cost (in "dollars after taxes") is not the complete answer to equipment management . . . but it's a big help.



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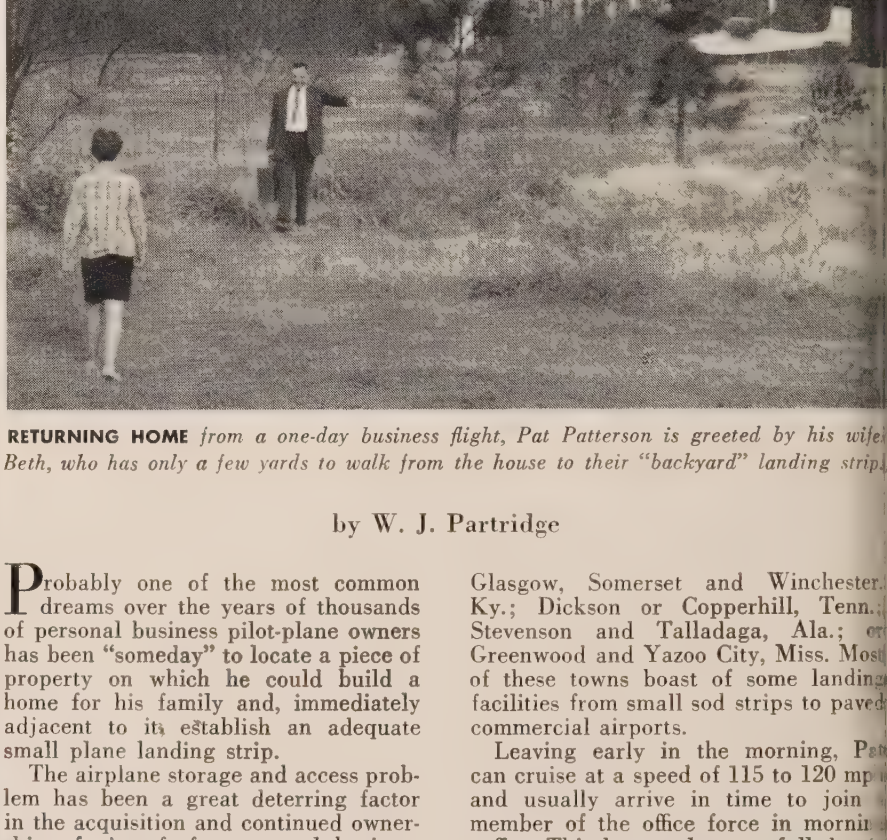
Business Flying Starts At Home



RETURNING HOME *from a one-day business flight, Pat Patterson is greeted by his wife Beth, who has only a few yards to walk from the house to their "backyard" landing strip.*

by W. J. Partridge

Probably one of the most common dreams over the years of thousands of personal business pilot-plane owners has been "someday" to locate a piece of property on which he could build a home for his family and, immediately adjacent to it, establish an adequate small plane landing strip.

The airplane storage and access problem has been a great deterring factor in the acquisition and continued ownership of aircraft for personal business purposes, especially in highly built-up metropolitan areas. Even executives commuting via air taxi to airline terminals have not fully satisfied this yearning, and many of these non-flying businessmen would own and operate their own planes if they could situate themselves as Howard M. Patterson of Tucker, Ga., has done.

"Pat" Patterson is a flying businessman with a Cessna 172 parked on a 1,200-foot landing strip in his back yard. Perhaps his story will give heart to many dreaming of "that day."

Pat is a partner of Patterson and Dewar Inc. engineering firm. His work involving power distribution lines calls for regular trips to such places as Glasgow, Somerset and Winchester, Ky.; Dickson or Copperhill, Tenn.; Stevenson and Talladaga, Ala.; or Greenwood and Yazoo City, Miss. Most of these towns boast of some landing facilities from small sod strips to paved commercial airports.

READY FOR BUSINESS *flight, Pat loads his Cessna 172 at handy home-side airfield.*

Leaving early in the morning, Pat can cruise at a speed of 115 to 120 mph and usually arrive in time to join a member of the office force in morning coffee. This leaves almost a full day in which to transact his business. Occasionally he must rely on renting an automobile or using a taxicab from the airport.

He has been flying for five years since learning to fly at Gunn Field near Lithonia in a Piper Cub. For several years Pat rented various types of aircraft in which to take trips and to build his flying time which now totals 300 hours. He is now studying for a commercial license.

After trying a number of different types of aircraft, Pat and his partner decided on a four-place Cessna 172. They bought one in 1956. The ship is well-equipped for cross-country trips including navigation and landing lights, usual instrumentation, ADF and VOR. His radio call, "Cessna 5079 Alfa," is becoming well known throughout the southeast.

Mrs. Patterson, Beth, admits she worried when her husband first started flying. Now she accepts and appreciates his flying trips for he comes home rested and, best of all, in time for supper. In fact, plans are now underway for a flying vacation.

Most any weekend you can see the silver Cessna with the call letters 5079A flying around the Tucker area. Flying is not only a means of business travel for the Pattersons but also sheer exhilarating enjoyment.

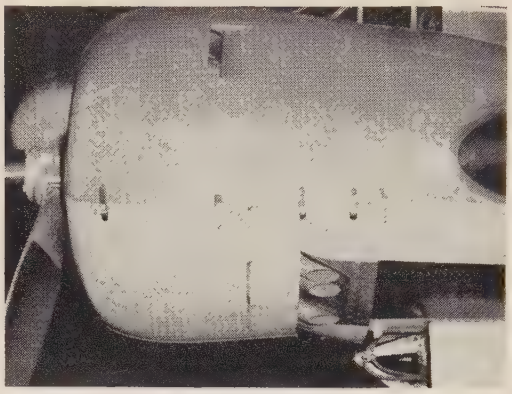
An Oasis...

for those who want the best in modification service

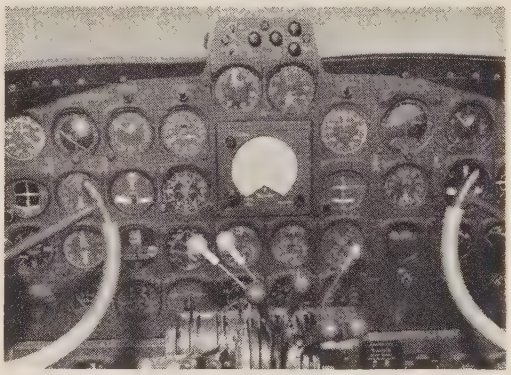
...that's OHIO AVIATION

All Beechcraft Modification Services Available

For many years Ohio Aviation has had the reputation for supplying comprehensive modernization and modification services to private and business plane owners. Recently added—a number of Beechcraft approved and engineered modifications that provide better appearance and increased performance. Here are a few of the modification and modernization services available at Ohio Aviation. We will welcome the opportunity to discuss them with you. For information write or call Charles Groff or James Speer at Ohio Aviation—TW 8-4646.

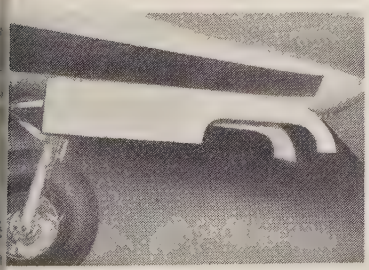


Super 18 Short Exhaust Stacks—reduce vibration, and eliminates back pressure.

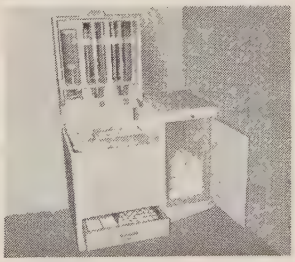


Complete testing and maintenance for all types of radar. Service by factory trained technicians.

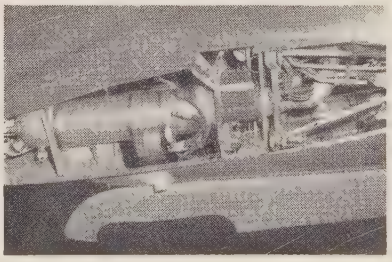
THE OHIO AVIATION CO. Dayton Municipal Airport
VANDALIA, OHIO



Super 18 landing gear doors. Encloses wheels. Reduces drag in flight.

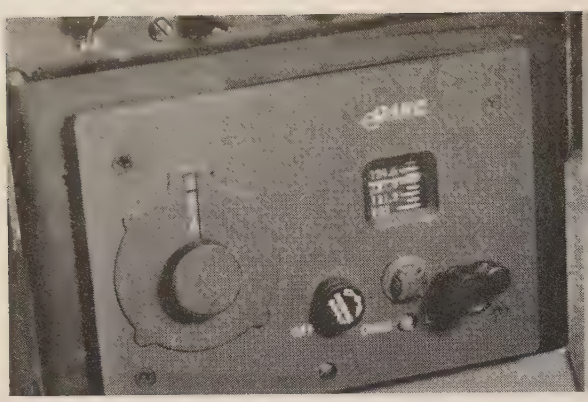


Utility Cabinet. Drink and Snack bar complete with thermos holder, glass, rack, ice provisions, etc.

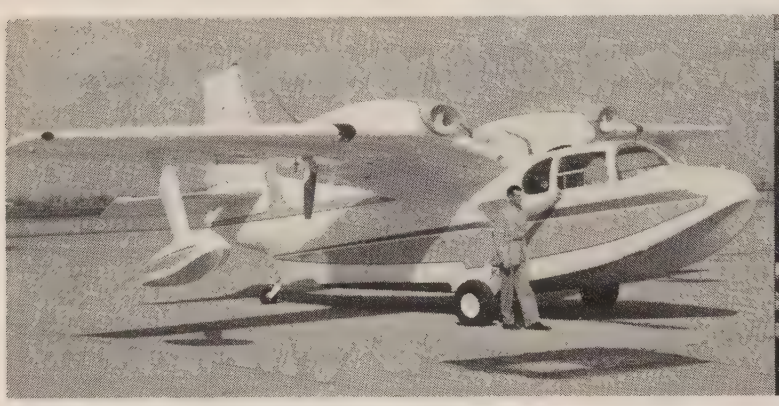


50,000 BTU Heaters—airline surface combustion type. Comfortable heat year around.

Circle No. 12 on Reader Service Card



ALOUETTE HELICOPTER *equipped with 22-channel VHF transmitter covering from 118.0 to 127.0 mc. Also has built-in localizer.*



TRECKER GULL *panel shows accessible center location of equipment. Next to plane is Wallace Watson, production test pilot.*

Built-In Serviceability Aids Both Pilots and Servicemen

There are many products of high quality being manufactured in every phase of aircraft communications today. Competition is keen, progress is fast. It is not enough that the piece of equipment functions properly with a minimum of maintenance and is sold at a reasonable price. One big factor which often spells the difference between success and failure of a communications manufacturer is the ability to build into the equipment that one vital element—consideration of the man who services it, his time and costs to the customer.

One of the more successful companies specializing in service-minded produc is Dayton Aviation Radio and Equi ment Corp. of Dayton, Ohio, know more familiarly as Dare Inc.

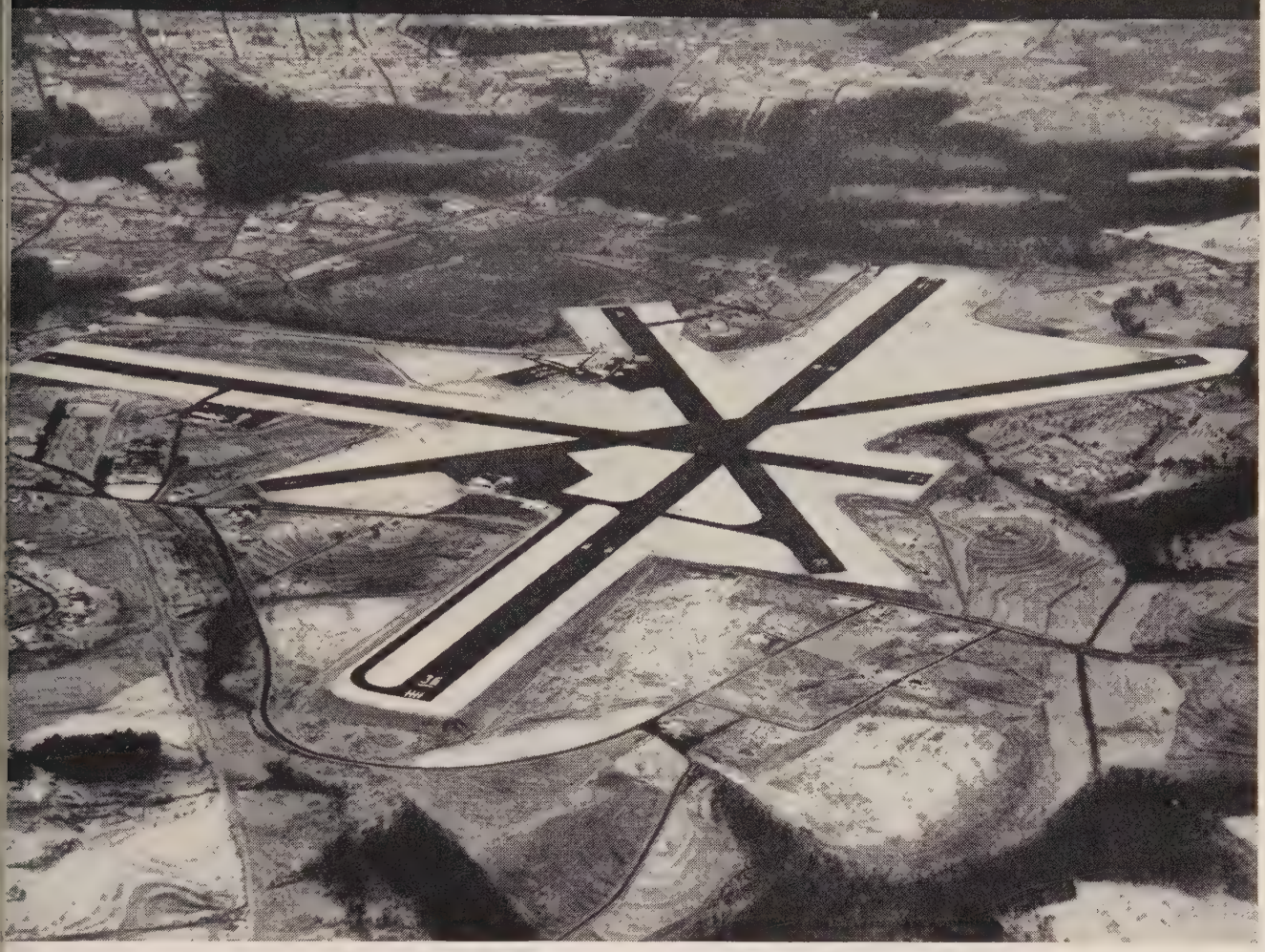
Louis Pitinsky, founder of the com pany now in its twelfth year, has held to the creed that a quality product which is easy to service would sell ring around equipment just as good in per formance but more difficult to repair o maintain. Starting as a small servic operation in 1946, he began his manu facturing in 1951 converting surplus military equipment into civilian use.

(Continued on page 50)

BELL 47J COPTER *Dare display includes Micro-Tuner, VHF Tunable Receiver and 22-channel transmitter. Special mounts are provided*

Test your cross-country memory

Can you name this airport?



Clue: *The Southern textile center it serves lies just east of the Blue Ridge Mountains. (Answer below.)*

Now test your aviation-oil memory: Can you give two important reasons why Gulf oils are better for your engine?

1. In addition to providing efficient, thorough lubrication, Gulf aviation oils help keep engines *clean*—and safe!

2. Gulf-clean engines can go longer between overhauls, because there's less wear and tear on engine parts.

Choose either new Gulfpride Aviation Oil Series D, the detergent oil, or Gulf Aircraft Engine Oil, the straight mineral oil—both keep your engine Gulf-clean and safe.

The airport is the Greenville, South Carolina Municipal Airport, a little over three miles east of the city. All runways are paved. The longest is 5,395 ft.

When you land here, we know you'll be pleased with the friendly Gulf service and the fine Gulf products available.

GULF

AVIATION PRODUCTS

Fly safely with a Gulf-clean engine

NAVICOM

PICTURE OF PROGRESS. *Shown side by side are the new transistorized power supply of the new Narco Sapphire 1016A and the vibrator type power supply of the original 1016 equipment. The new, compact design saves 4 lbs in weight, 3 in. in length and greatly increases efficiency and reliability, Narco says. The versatile 1016A includes provision for Single- and Double-Channel Simplex operation as well as Cross-Channel operation with simultaneous Glide Slope selection on the receiver portion.*

Circle No. 14 on Reader Service Card

100% Control Airway Comments Due This Month

All users of the nation's airspace interested in making comments on the proposed Positive Control Airway segment of Victor 1510 are urged to submit their opinions to the CAB by June 25. Corporative operators now using turbo-prop or planning to use turbo-prop or jet aircraft in the early future should study closely the CAB Draft Release 58-8 (available from the Bureau of Safety, CAB, Wash. 5, D.C.).

Briefly, the proposal is to authorize the CAA to designate a portion of airspace between 20,000 ft and 35,000 ft, not over 40 miles wide, as a "positive control route segment" within which only IFR-plan ATC-controlled aircraft (meeting all IFR requirements plus direct-Center communications capability), would be permitted. This effectively bans *all* VFR activities in this airspace including the use by ATC-controlled aircraft of a VFR-restricted clearance to expedite their handling!

The experiment of one year duration is especially designed to seek out, tie down and resolve the problems of 100% control of all enroute traffic in any portion of the airways, and with particular regard for the apparent extraordinary inadequacy of "see and be seen" VFR separation techniques at very high altitudes and the airspeeds common to those altitudes.

Its possible pertinence to application at lower altitudes, while specifically excluded by the proposed wording "between 20,000 to 35,000 ft," lies in the further comment that "the inclusion of this requirement . . . (IFR capability—Ed.) . . . in this experiment should not be construed as a precedent to exclude VFR operations in *future extension of this concept to the lower altitudes.* Also, note that the lower altitude in the proposal is 20,000 ft, or below the present Continental Control Area floor of 24,000 ft. The latter was scheduled to be lowered to 15,000 or 14,000 ft by this spring, and could bring the Positive Control segment floor down with it if the final version of the proposed regulation should inadvertently drop or modify the 20,000 ft floor.

This then would bring the relevancy of the proposal home immediately to those business aircraft operators now or very shortly operating pressurized or oxygen-equipped high-performance aircraft.

The problem of *crossing* through such a "VFR-prohibited area" or airway would then acquire immediate urgency. As presently proposed, any traffic wishing to transit such a "positive control area" would be asked to plan "routing over a VOR station or other readily recognizable and *precise* fix. Additionally, to submit the request for transit approval as far in advance as possible" for obvious separation calculations, and provide in the request only that operational flight plan information necessary for air traffic separation purposes. Presumably, this would also be subject to IFR separation standards, clearances and delays.

It is expected any such designated area or airway segment would be clearly indicated on all appropriate aeronautical maps and charts for the benefit of airspace users seeking to avoid, as well as to operate, within such areas.

The duration of the experiment is proposed as one year and V-1510 (NY-CHI) was picked because the peripheral communications facilities (direct pilot-center radio stations at locations near control area boundaries) are especially good for the start of the program, and comparatively heavy hi-altitude traffic along this route. And planned improvements along this route will facilitate its extension as the experiment results warrant.

Comments by any of the airspace users who are definitely in the category of potential or present hi-altitude operations should not pass over lightly the opportunity to assist in the making of this vital regulation. Now is the time to submit your comments *in duplicate* to CAB and an extra carbon for a copy to NBAA will enable them to better evaluate the wishes of all business aviation on this subject.

That ATC Man and Public Safety by The Air Traffic Control Assn. (Abridged)

Air Traffic Control is basically designed as the guardian of our Federal Airways insuring "safe, orderly and expeditious" flow of civil and military air traffic at all times. With more than 100,000 aircraft of all types—including military, commercial, business and private flying—using the airlanes at the same time, this vital role of traffic safety and regulation is self-evident.

Even on a perfectly clear day the collision potential makes every busy airport or terminal area a "dangerous intersection." For those who fly in IFR conditions, it is built-in protection against mid-air collision.

The record speaks for itself. Although there have been mid-air collisions, the fact is that during its entire 20-year history the Air Traffic Control Service has not been responsible for a fatal collision between two aircraft operating under instrument weather conditions!

Daily headlines that tell of "near misses" and mid-air collisions involving aircraft not operating under ATC jurisdiction are grim reminders that something is wrong.

The system is over-taxed and rapidly growing obsolescent. Designed for a day when there were less than 13,000 certificated aircraft in the entire country, the system is being called upon to service almost that many aircraft in any given 24-hour period.

There is today public demand that we make the sky safe.

Congress has seen fit to provide more funds. This money is being spent to develop an interim system capable of handling today's traffic loads without sacrificing safety. Beyond this, on a Presidential level, is long-range plan-

ıg for the design and development a complete new system.

Whatever is being done about it, ere are two constants in Air Traffic ntrol that probably will never ange: (1) a continuing battle of hnology, (2) it will always be de- ndent upon the human judgment and skill of the men who use it.

This puts the prime responsibility the shoulders of the Air Traffic ntroller. The environment in which lives and how well he can and does ry out his responsibilities, holds the y to public safety.

Ingenuity and resourcefulness, pro- ssional pride and a willingness to ve on the part of operating person- l have made the ATC system as good it is today.

But this "HUMAN element" today being strained to its breaking point there is growing evidence that the ad is becoming too heavy.

The Controller is continuously con- onted with the spectre of tragedy and saster. Day in and day out he is aling with human lives, matching ill and know-how against the odds human error.

And how costly that error! One mis- ke and two heavily-loaded aircraft uld collide with resultant death to l occupants, destruction of aircraft d untold damage and lives lost on e ground. This is the spectre that lds to the stress and strain of the ntroller's job.

Then, there are the growing com- lexities of the job itself. Where once ntrollers handled a maximum of four six aircraft landings per hour in bad eather, today the number is tenfold. peed is another thing; there is little me to think; the Controller must act. ntinuously taxing his human endur- ıce and capabilities to the limit.

Many ingenious electronic devices e in the process of development hich will compute, relay information, ost and store data, signal and ring larms. But most of them *are still in e laboratory.* And none of them can *ink,* none of them can apply *judg- ent.* As the new machines come into eing the Controller will have to de- elop proficiency and expertness in ieir operation.

Control work has many peculiari- es. For one thing normal homelife is isrupted by shift work and irregular chedules. In addition, he works a traight eight-hour day, and his re- ponsibility does not always end with ie hands on the clock.

It wouldn't do, for example, for a ontroller to suddenly get up and go ome right in the middle of an ATC roblem leaving the aircraft stranded n the soup. Nor can he simply turn he job over to a relief without briefing he next man in all phases of the ituation at hand. There must be suf- icient overlap and familiarization time etween shift changes to assure safety.

The Controller accepts this added esponsibility as part of his profession. t means he must gear his life to a job hat is anything but routine.

The Controller regards his job as a profession—he likes his job and is dedicated to it. But he is concerned about advancement and his future.

Air Traffic Control is a highly technical profession. He must learn to use the tools of his trade with a high degree of skill and proficiency. These tools are so highly specialized that the training needed doesn't give him time to be anything else but a good Controller.

The result is that many doors are closed to Controllers for advancement into other administrative fields when they reach a certain critical period in service age. There simply aren't many supervisory jobs. Approximately only 10% of the total personnel engaged in Air Traffic Control work occupy supervisory or administrative positions.

45 to 50 years of age is the maximum limit at which a Controller can capably perform his tasks without jeopardizing public safety. Air Traffic Control is a young man's game. The complexities of the system, the tools it relies on, demand extreme mental and physical capabilities and coordination incompatible with middle age. The Controller knows this. It is only natural that he should be concerned about the future when he can no longer perform at the console.

The present retirement laws which govern most Federal employees are inadequate when applied to the status of the Air Traffic Controller. The Controller is a guardian of public safety and human life as much as the fireman, the policeman or the FBI agent. Although his life personally is not in danger, the Controller's responsibility for the lives of others is comparable to the law enforcement personnel. This. alone, is an accelerating fatigue factor recognized in other professions and occupations.

For the Controller there are three possibilities: (1) He can hope that his physical condition will permit him to stay on the job until he reaches the age limit required under existing law (65; or 30 years service) for full retirement benefits. (2) He can apply for disability retirement if his physical condition warrants. (3) He can apply for retirement at a younger age (55) at a reduced annuity. The latter two actions *may be required* in the interest of public safety thus *reducing* his retirement income through no fault of his own.

These are not considered equitable solutions compatible with public safety (i.e., a Controller may hide a disabling condition for financial reasons).

The problem is to find a workable solution compatible with public safety, the well-being of the personnel involved and the cost to the nation and the aviation industry.

Toward this goal several approaches have been considered. A shorter work day and work week designed to prolong the efficient life of the Controller is one. But this would not necessarily assure that his reaction time and judgment would not slow down in late middle age. It would also require additional personnel.

It seems more logical to provide a replacement program which would eliminate personnel from control duties at the time when their physical condition presents a danger to public safety. Obviously, this plan would not be fair or equitable if it meant removing personnel without making provision for their future and to reward them for their service.

The answer is a retirement program which makes provision for proper timewise replacement of Controllers and also their just welfare and future.

The association urges the public sup-

Miniaturization Award

Aircraft Radio Corporation, of Boonton, N. J., received the first annual Miniaturization Award for its success in design and production of an automatic direction finder which is approximately one-fifth the size and one-third the weight of previous equipment used as a standard for this air navigation purpose.

The competition was sponsored by Miniature Precision Bearings, Inc., of Keene, N. H., in the interest of furthering the concept of miniaturization, so important today in aircraft, missiles and other fields.

Arizona's Governor, former U.S. Senator Ernest McFarland, boards Apache commuter express at Sky Harbor for business trip to Nogales, Arizona.

Another in a series on commercial aircraft operations . . . why light aircraft, like all major airlines and business fleets, use Champion Spark Plugs. Noted aviation authority reports on APACHE AIRLINES'

Desert Express

by

HERB FISHER

International aviation authority, veteran test pilot, author

In a land once left to wind, sun and Apaches, the world's longest unicipal airstrip shimmers in 120-plus heat. A TWA Constellation mbers in. A jet bomber, built there, roars off. An American DC-7 sgorges squinting passengers—participants in modern Arizona's panding wonderland of industrial, mining, resort and agricultural ogress.

At Gate 1, Tucson Municipal Airport, three men with brief cases ard a tiny, air-conditioned Bonanza, desert-hued in pastel paints. ree businessmen. A doctor, a lawyer, an Indian Chief.

Clock says 2:15.

The world's smallest intra-state certificated scheduled airline rams "commuter express" down a fraction of the 15,000-ft. runway . . . st bombers, giant airliners, modern factories . . . over the "young-yscraper" skyline of mushrooming Tucson . . . into the 50-degree hill" above the 9,000-ft. Santa Catalina Mountains.

Forty minutes from Tucson takeoff, the *Apache Airlines* business mmuter drops from sunny skies to Sky Harbor Airport, Phoenix, ank crossroads of a nation. Minutes later, engine hot, Apache ngs back toward Tucson—with a sena-r, a mayor, a rancher.

To the southeast, meanwhile—in the e-time stronghold of Geronimo, Co-ise and Satanta—another Bonanza slips rough legendary Apache Pass to Sierra sta and historic Fort Huachuca, bloody ontier outpost and modern-day Army Electronics Proving Grounds. Time from Tucson: 20 minutes. Passengers: A colonel, a scientist, a technician. Freight: The usual items requiring special handling or immediate delivery—plus a delicate bouquet of roses for a G.I.'s lady friend.

At the Mexican border, a third Apache Airlines commuter rises from Nogales International Airport, campsite of Spanish *conquistadores* four centuries ago. Enjoying spectacular scenery from the relaxful cabin are a mining engineer, Mexican envoy and University of Arizona official...

Back in Tucson, a wiry Westerner sweats over torn-down engines in one of Tucson Aviation Company's many hangars. Phone jangles. He talks, slips quickly from coveralls into Western business garb, taxis a fourth desert-hued Apache commuter to Gate 1, makes rapid flight preparations. Six businessmen arrive. Then two Beech Bonanzas dart over the mountains on the same scheduled run.

The A&E mechanic piloting the extra section is "Mr. Bonanza" himself—M. L. "Babe" Clements, quiet, soft-spoken owner and president of both Apache Airlines and Tucson Aviation Co., and a state CAA Maintenance Inspector. He's "Mr. Bonanza" in aviation circles because they say he knows more about flying and maintaining Bonanzas than nearly anyone else. Some 7,000 of his nearly 10,000 hours have been in Bonanzas —and many times that number "under-the-hood" in Bonanza engines and airframes.

Herb Fisher

A top mechanic with TWA until 1941, Flight Line Superintendent for Consolidated Vultee during the war, Babe started Tucson Aviation in 1946. Today it is sales and service center for much of the Southwest's light aircraft, and for northern-based aircraft of the Mexican government—maintenance to major overhaul. TA also provides precision flight instruction — classroom and aloft — for businessmen and University ROTC units. TA flies charter and contract missions—Cessnas and Bonanzas under U.S. Forest Service contract, for example. In the remote, pine-covered Catalinas north of Tucson, Babe and his men dropped 4,200 pounds of supplies to firefighters in a single day last summer.

Apache Airlines began just a few months ago as a natural outgrowth of

ache swings by new Tucson tower adjacent new municipal trip, world's longest. Tucson Airport Authority celebrates Years of Aviation Advancement ($6 million airport improve-nts) October 18-19 with dedication of complete new airport lities and base for 152nd Fighter-Interceptor Squadron of Air ional Guard. Tucson Airport Authority forecasts for next ade: "Best airport in the West for jets."

Apache Airlines moves proudly over ancient Apache trails skirting snow-crowned Santa Rita Mts., rising along Mexican border from fan
Saguaro cactus forest. Champion-fired Bonanza has automatic rudder control for rough-air comfort; plush cabin is air-conditioned. Pilot: Babe Cleme

Tucson Aviation—a natural outlet for a man steeped in maintenance . . . a perfectionist, who won't send a plane up with a harmless oil smudge on a cowling; a dynamo, who doubles as pilot or mechanic far into the night, cleans shops or washes planes on Sundays, returns at midnight to personally put brake lining on a plane—and hasn't had a day of vacation in ten years.

Babe's commuter and international airline feeder service now carries over *1,000 persons a month!*—and he's planning route expansion to other cities in the business-booming Grand Canyon State.

Constant engine-straining takeoffs from airstrip elevations as radically varying as *1,100 feet* at Phoenix and nearly *5,000 feet* at Ft. Huachuca . . . continuous, engine-burdening, high-RPM "climbing-out" at drastically different altitudes—26 times daily, every day . . . engines heating to near-maximum temperatures, cooling rapidly, then again heating quickly . . . all this, compounded by other operational detriments such as Mexican fuels and flight infiltration of fine abrasive sand—*that's why "Mr. Bonanza" sweats long hours balancing and perfecting his engines with the very finest products of American engineering.*

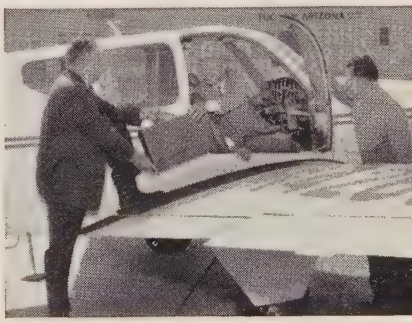
"We've had long experience with many kinds of aircraft and their vital components in this grueling proving ground," Babe says. "And you just *can't beat a Beech Bonanza fired to life by Champion Spark Plugs.*"

Babe has obtained CAA authorization for 1,000-hour engine overhauls instead of the usual 800—despite Arizona's wicked extremes of heat, elevation and elements! Champions have been instrumental in making this possible:

"Though I could get 1,000 hours on Champions in Bonanzas easily—I've done it—I actually replace plugs much sooner," Babe says. "My mechanics tell me I'm crazy, 'cause the plugs are still practically good as new. But the point is—that's *how* I get peak engine performance right up to the 1,000-hour major: minimizing wear by keeping vital components new and clean all the time . . . reducing engine load and vibration by balancing . . . requiring my pilots to refrain from the common practice of RPM overloading despite its economy.

"Since an engine's life and reliability depend *so much* on the spark plug, we *must* use only the most dependable plug. Charles Hoefelmann of General Aviation, the Champion distributor here, gives us quick service on the *very best.*"

Spanking this hustling baby airline maturity in safety and service perfecti with Babe are several "old-timers" aviation: The four regular and two stan by pilots have a galaxy of experience a professional ratings—CAA-certified A& mechanics, for example; they have average flying time of 8,000 hours, average age of 39, and all are family m with children. Like Babe, they live, e sleep, and breathe aviation . . . and a genuinely proud of the dauntless Apac spirit they've ingrained in the character their modern young airline flying ancie Apache trails.



R.W.F. "Bob" Schmidt, retiring President, American Assn. Airport Executives, and Manager, Tucson Airport Author greets Tucson Mayor Don Hummel, in from business trip Apache commuter (l/r). Pilot: Charlie Jenkins.

Circle No. 15 on Reader Service Card

Night maintenance at Tucson Aviation Co. Upper left, Apache commuter comes in with landing lights on.

"Champions in Bonanzas—the perfect combination," Ba Clements (r) tells Tony Orgain, Champion Representative, Charles Hoefelmann, Champion Distributor (l/r).

Champion Spark Plug Compa

port and Congressional enactment of an amendment to Public Law 854 or other appropriate legislation which would: FIRST—Permit all civil employees of the Federal Government having completed twenty (20) years of Federal service as an *active* Air Traffic Controller to retire voluntarily without reduced annuity regardless of age. SECOND—Credit all civil employees of the Federal Government applying for retirement but not eligible under the above provisions, with (1½) years of creditable service toward retirement for each (1) year of Federal service as an *active* Air Traffic Controller. [Definition, an *active* Controller, one who is qualified to and *engages* in the actual control of air traffic, or who supervises a facility (tower, center, etc.) or its control functions. The emphasis on "active" service recognizes that the accelerated aging factors cease to apply when a Controller is promoted or transfers out of actual control work.]

European Victor Airway System Expanded

Of interest to the increased number of business aircraft expected to fly to and within Europe this summer will be the announcement by The Wilcox Electric Company, of the sale to the French Government of 10 complete 200 Watt VOR Stations and appropriate operating spares. The units are part of a substantial airways modernization program throughout France and her dependencies, and bring to 22 the number of Wilcox VOR installations in service with the Government of France.

A R C Assists ANG Airborne Electronic Maintenance Training

Air National Guard personnel concerned with use and maintenance of airborne electronic equipment are being trained in the field by a mobile unit provided by Aircraft Radio Corporation, Boonton, New Jersey.

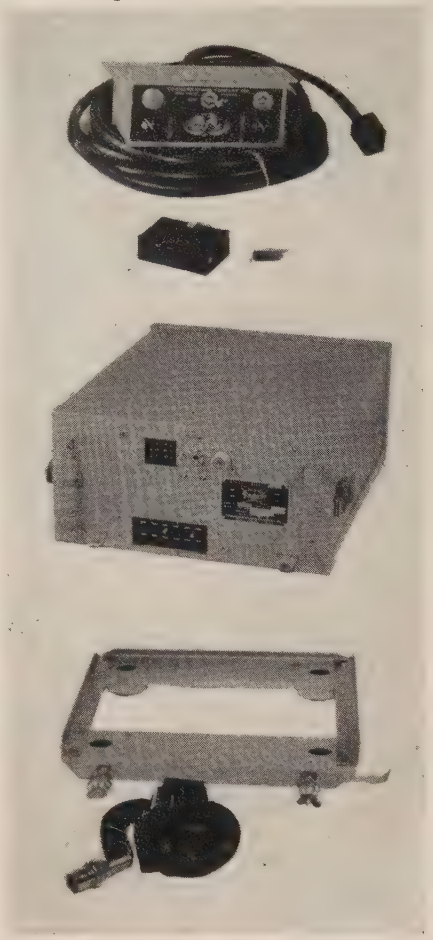
Homer Bailey, electronics engineer at A R C, will conduct the mobile unit classes for National Guard pilots and signal technicians.

A 123.0 Item

The installation of Aero. Advisory stations by fixed base operators on control airports is spreading rapidly throughout the country. The great added convenience to their customers has paid measurable dividends in attracting inbound business.

When a public agency operating such an airport provides that service in the interests of the flying public as well as their tenant fixed base operators, it merits special commendation. Two of the most recent such services to open up on 123.0 mc is the City of Bridgeport at BDR Municipal and the City of Nashville at Berry Field, BNA.

New Air-Ground Company Radio Interchangeable 12-24 Volts



Circle No. 16 on Reader Service Card

Communications Company (COMCO) announces a new VHF-FM FLIGHTCOM two-way radio for airplanes and helicopters. The new FLIGHTCOM is especially designed for private, executive, utility and police aircraft needing communications with ground VHF-FM mobile systems.

The FLIGHTCOM is instantly changeable between aircraft having 12 and 24 volt battery systems. A complete package weighs 21 pounds including an ATR type of shock mount, control-box with cables, and microphone. The transmitter has a power output of 35 watts in the 25-54 Mc band and 25 watts in the 144-174 Mc band. A new type 400-R receiver is used which is easily convertible for either broad or narrow band operation. The new type 400-7T transmitter is FCC type accepted and meets the mandatory narrow-band technical standards. The new unit is certified with Federal Civil Defense Administration for Matching Funds Program.

The low band (25-54 Mc) model is priced at $585.00 and the high band (144-174 Mc) at $600.00. Dual frequency operation adds $30.00 to the above prices. The package comes standard with a differential noise cancelling microphone; however, a headset with boom microphone assembly is available for helicopter operation at extra charge.

Aviation Weather Services Drastically Curtailed

In an NBAA bulletin, part of the regular service to their membership, NBAA last year pointed out that proposed cuts in the FY58 weather bureau budget would mean a dangerously low level of this vital aviation service. As predicted weather bureau budget requests were reviewed and cut by the Department of Commerce, the Bureau of the Budget, and the Congress. All of the funds which were disallowed were to have gone to support aviation weather service.

The first result was permanent staff reductions in *eighty* stations throughout the country!

Station program adjustments in line with the above reductions in force typically read—"Pilot briefing and general weather assistance available only as other duties permit during 16 hours of the day. Radar is being installed but will be operated only as required by forecasts of severe weather, since no specialist can be assigned."

Personnel required to implement an improved system of "inflight weather safety service" at nineteen major terminal locations and to establish a new flight advisory weather service (FAWS) Center at Phoenix, Arizona were disallowed.

Plans to establish a full time weather bureau observing and pilot briefing offices at O'Hare International at Chicago and the Municipal Airport at Long Beach, California, were dropped.

Plans to provide observations during daylight hours (but NOT at the airport) at locations the CAA was moving from, were dropped.

Funds were allowed for only 16 of the 46 locations for which end-of-runway "bad weather" equipment was requested.

The funds requested for rental of high speed electronic computers needed in developing better methods of forecasting by numerical processes were denied and funds for the personnel necessary to operate and maintain newly purchased radar equipment were denied.

NBAA points out that *NONE* of the above programs disallowed last year *EVEN APPEAR* in this year's budget request! In fact, because of lack of funding support for their aviation weather programs, these will be cut further starting this month!

Area-type aviation forecasts of significant weather will be issued for three areas in lieu of the present four regional synopsis and 25 area aviation forecasts.

Terminal forecasts will be reduced from the present 349 to 250 locations and those for which 24-hour forecasts are issued, many at critical spots, will be reduced from 109 to about 90. Winds aloft forecasts will be discontinued at 11 locations.

Whereas executive aircraft instru-

(Continued on page 64)

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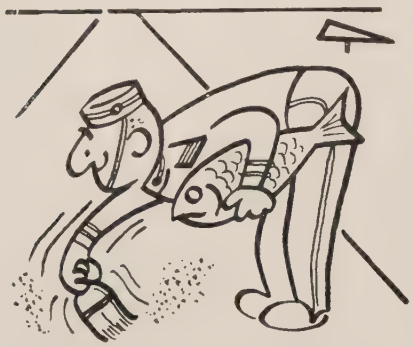

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INDIANA TECHNICAL COLLEGE

HAVE YOU submitted your company's MISS NBAA candidate for 1958? Time's a-flyin'!

Round Table

(*Continued from page 20*)

he will never get that variety of fuels.

Campbell: Mr. Smith, do you want to say something about this?

L. C. Smith (*Wright Aeronautical Div., Curtiss-Wright*): Through the years, we as well as other engine manufacturers, have worked closely with the fuel companies. I think we can say that the development of our engines has kept pace with the development of fuels. As fuels became better, we were able to produce better engines. You mentioned a new, higher rated fuel. It will open up still further possibilities as far as ratings of existing engines are concerned. But you don't get something for nothing. Use of this fuel in our engine has presented certain problems which are going to have to be worked out before the new fuel can be released for even trial operation by an operator in the field.

P. J. Landi (*Port of New York Authority*): As you know, we have operated helicopters for approximately seven years. At first, we experienced an unusual amount of spark plug fouling. Fortunately, we have devised an octane of our own with the help of Shell Oil Co. What we did was to blend our fuel . . . 50% 80 octane and 50% 100 octane. We came up with about a 91 octane at 2.5cc as compared to the normal 91 octane of 3cc. We found that by using this blended fuel it reduced spark plug fouling. At first, we were using an additive of TCP. We found later that this additive was not serving our purpose, so we eliminated it and are sticking strictly to our blended fuel. We're getting good performance.

Campbell: For the record, this 3cc comment refers to 3cc of lead.

Haxby: Let me explain the petroleum companies' position on cross blending of fuel in the field. We mentioned earlier that we have five grades of fuel available, one being as low as ½cc of lead, the rest being roughly 4cc of lead. There is only one way that you know what kind of fuel you have in an engine, with respect to octane or performance number, before it actually goes into use. That is by the performance of the F-3 and the F-4 octane number tests. These are done in a petroleum refinery laboratory on fuel as delivered to a customer. Although calculations are reasonably good, you cannot be sure what octane number you are putting into your equipment except by measurement. we know of cases in military helicopter applications where this was tried. It was successful for some time, then suddenly failed. After much investigation it was found that 80 octane fuel had been blended with 91, but it was not 80 octane aviation gasoline. Our GI's had blended 80 octane *motor* fuel with 91. They were putting fuel into an engine on the basis of a calculated performance. They did not measure and know what they were using. Further, in remote situations there is also a problem of cleanliness during blending.

J. L. Rhodes (*Atlantic Aviation Corp.*): We deal with much smaller aircraft, aircraft identical in appearance, yet some require 80, some 91. Is there any plan by the oil industry to get a fuel that would cover the 80 and 91 category . . . say 100 or 130 octane?

Foster: No. We are attempting through our dealer organization to alert the field to the problem involved in dual fuel use, for example, in a 1957 vs 1958 Tri-Pacer, to make everyone aware of what the actual fuel requirements are for these airplanes. This is a factor that will have to be watched because, frankly, there have been some cases reported of misapplication of fuel. An operator has a minimum fuel requirement of 91 grade, and he gets 80 because the airplane he is flying is a type that the dealer has been accustomed to servicing with 80. We're working with the manufacturers themselves for distinctive marking of the fuel tanks. We also use color coding.

Rhodes: Those things are all well identified, but they'll still put 80 in a cap marked 91.

Foster: We appreciate this point. We're trying to make service people more observant, to look before they start pumping.

Rhodes: Your bracket is 30 points, for instance between 100 and 130, 115 and 145. Between 90-96 is 91 octane; between 80-87 is 80 octane. Isn't it possible to produce a fuel that would cover the entire category and be suitable?

Haxby: I'm sure all of you are aware that 100 is a lean mixture rating and 130 is a rich mixture rating. The only way this is possible is that, for example, a 100 grade lean mixture rated fuel, automatically takes care of both the 80 and 91 requirement. In other words, an 80 octane fuel will not satisfy requirements of 100, but 100 will satisfy requirements of both 80 and 91. If a 95 lean mixture fuel is wanted, it can be produced. But can it be produced and stored throughout the country on an economical basis? As a matter of fact, one is better off if the engine manufacturer has designed his engine to take 100 grade fuel than to ask for an additional grade.

Rhodes: I agree with that except in this lead bugaboo. When you get into these higher fuels you run into lead. In that particular case it would be up to 115 or 135. That just fouls up these little engines.

V. J. Mecca (*Aircooled Motors*): What is the future of 80 octane fuel? We have information from overseas users that 80 octane is either in short supply or no longer available. They must use 91. We are told 91 is less expensive than 80. This information comes from both Europe and South America. Are we going to be faced with the same situation domestically where eventually 80 will disappear from the market?

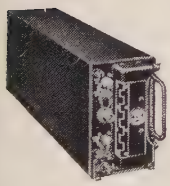
Foster: The 80 octane aircraft is here for a while we feel. If we would drop a grade, or if we desired to drop a grade domestically, it would probably be the 91 grade. (*Continued on page 56*)

marching forward with...

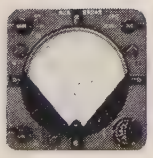
AVIATION

Grumman Gulfstream

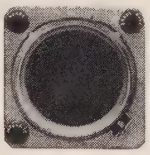
The aviation industry and RCA have long been partners in progress. To this partnership, RCA has contributed a wide range of electronic aids that have played important roles in bringing aviation to its present high level of dependability, comfort and safety. A few that have found special application in civil aviation are named here.



RCA Air Traffic Control Transponder (AVQ-60) automatically and instantly enables the traffic control radar to locate and positively identify aircraft within its range. Light in weight and compact, it is designed for airline, business and military use.

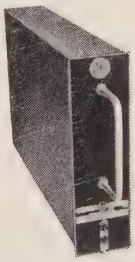


RCA Weather Avoidance Radar (AVQ-50) brings the comfort and time-saving features of airborne weather radar to aircraft with power and weight limitations, such as Aero Commander, Twin Bonanza, Beechcraft Super-18.



RCA Storage Display Tube Indicator increases the effectiveness of the display by permitting the reading of the indicator in broad daylight without hood or shielding.

RCA Weather-Mapping Radar (AVQ-10), now used by many of the world's leading airlines, enables the pilot to "see" and evaluate the weather many miles ahead so that he may avoid areas of turbulence. This makes long and costly detours unnecessary, saves time and increases passenger comfort.



RCA Marker Beacon AVR-200 meets the demand for lightness, transistorized design, low power requirement and minimum maintenance. Functions on DC or AC primary, and actually needs less power than any of the three lamps it operates.

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Helicopters for Business

Helicopter Company Reps Compare Costs of Copter and Surface Transportation for Executive Use

Even though the hourly direct costs of the helicopter are greater than those of fixed wing or surface vehicles, executive copter operations can be used profitably carrying persons earning $10,000 per year as well as speeding up transportation. This is the conclusion of William H. Madson and Lloyd H. Sloan, both of Vertol Aircraft Corp.

In a paper to the Society of Automotive Engineers, Madson and Sloan point out that "During the past decade the personal transportation requirements of the American businessman have taken on an unprecedented significance. . . . Businessmen and particularly executives have taken to the air. The private business airplane has established itself in a spectacular manner."

Progressive businessmen have found that with their own airplane they can move independently, at speeds competitive to the airlines', to nearly all of the country's 7,000 airports and not just the 550 cities served by the airlines.

Even the modern business airplane has limitations involving the ground transportation from airport to destination as well as strict flight patterns.

The helicopter breaches the gap between ground and fixed-wing air transportation. The transport helicopter has evolved from an experimental low-capacity vehicle to the executive transport helicopter capable of carrying ten passengers and 1,000 lbs of cargo up to 100 miles at block speeds in excess of any known commercial form of transportation today.

The authors refer to a paper by Peter Masefield, Bristol Aeroplane Co., before the Institute of Transport of Great Britain. He uses the term "average speed between city centers" instead of "block speed" to show the range of superiority. American studies have indicated superiority up to 180 statute miles.

The tandem rotor configuration has made it possible for passengers to move about the cabin in flight without concern for the resulting center of gravity changes.

Regarding the helicopter in business transportation, the question arises as to whether the time saved can be exploited in view of the operating costs of the helicopter compared with those of other means of transportation now in use. Comparisons between airplane, helicopter and surface transportation were made over a hypothetical route complex, based on actual locations.

It was figured that hourly direct costs reach a value of $158,340 per year for helicopters and $129,020 for fixed wing and surface vehicle costs. Time consumed annually for the helicopter transportation is only 780 hours compared to 1,888 hours for the airplane-surface method. If a wage of $40 per hour is assumed for the average number of passengers (six) an actual saving of $15,000 per year can be realized, Madson and Sloan estimate.

"The $40 per hour value represents an average passenger salary of about $14,000 per year so that the saving of $15,000 per year indicates that the helicopter can be used profitably carrying people earning $10,000 per year."

New Lightweight Hughes Model In Production At Calif. Plant

Production is under way on the first Hughes Model 269A helicopters, Rea E. Hopper, vice-pres., Hughes Tool Co. Aircraft Div., Culver City, Calif., announced.

The lightweight, two-place, copter weighs 890 pounds empty and carries a useful load of 660 lbs. First production models are for the U.S. Army, but later models are expected to be available to a wide field of industries.

According to Hughes engineers, the aircraft is "radical in its simplicity and economy." Top speed is 90 mph with a cruising range of 150 miles. Powerplant is a 4-cylinder, air-cooled 180 hp Lycoming.

"Low first cost and minimum operating costs have been prime factors in our planning," Hopper said of the machine which has been developed without aid of a military contract.

Transition From Helicopter To Autogyro Flight Achieved By VTO

Britain's Fairey Rotodyne accomplished transition from helicopter to autogyro flight when it took off from White Waltham airfield near Maidenhead, Berks, and climbed to 4,000 ft as a helicopter. At that altitude the power was transferred from the rotor to the forward-facing propellers. The craft flew in straight and level flight with the rotor "free-wheeling."

The Rotodyne had made 71 flights since its first flight on November 6, 1957. According to Fairey, the successful transition puts the Rotodyne ahead of any other helicopter or vertical take-off aircraft in the world.

Powerplants are two Napier Eland turboprop engines.

Weather Radar Helicopter Evaluation

The Radio Corporation of America has been awarded a contract by the Army for installation of the AVQ-50 lightweight weather radar system on an Army H-21 helicopter, to evaluate potential use of the radar in the Army's aviation program.

Djinn Is Certified By CAA

The tip-jet-rotor Djinn helicopter is the first of its type to be certified by the CAA. The craft is the second turbine-powered helicopter to be CAA-certified. The other, the Alouette, and the Djinn are both Sud Aviation products.

The Djinn is two-place with compressed air from a turbine ducted to the tips of the rotor blades. There is no tail rotor. Steering is by a rudder in the jet stream of the turbine. It is the first tip-jet-rotor helicopter to be certified anywhere in the world. (See Skyways, March 1958, page 14.)

Los Angeles Chamber of Commerce Urges Helistop Building Code OK

Immediate revision of the Los Angeles Building Code to include provisions for rooftop and ground level "helistops" within the metropolitan area is urged by the Los Angeles, Calif., Chamber of Commerce.

George B. Gose, Chamber president, reports receipt of numerous inquiries asking what is being done to prepare the Los Angeles area for commercial and private use of helicopters on a large scale.

"Because of the versatility, usage and acceptability of the helicopter, this business is expanding more rapidly than any other phase of aviation today," Gose said.

He said many Los Angeles firms are

interested in establishing roof top or ground helicopter facilities, but it necessitates establishing building and safety codes first.

One of the Chamber's recommendations is to clearly mark helicopter landing areas to differentiate between a "helistop" and a heliport where refueling and servicing can be performed.

Laws Needed To Accommodate Copter Operations To Benefit Communities To Fullest, Says AIA President

Gen. Orval R. Cook, USAF (Ret.), president of the Aircraft Industries Assn., told members attending the 14th annual forum of the American Helicopter Society that "a nationwide effort is needed to educate the public and their officials at the state and local levels on the peculiar administrative and regulatory requirements of the helicopter age."

Speaking to the largest American Helicopter Society gathering ever to meet (533 persons were registered), General Cook pointed out that it is unrealistic to enact regulations which prevent the helicopter from operating into and out of congested business areas, even though all of the safety requirements of the Civil Aeronautics Board and the Civil Aeronautics Administration have been met.

"Just now, there is an upsurge of interest at the municipal level in heliports," Cook said.

The AIA president concluded that "A uniformly approved set of recommendations acceptable to manufacturers, operators, airlines, operators of airports and heliports, must be evolved. Then every element of the helicopter fraternity must get to work at local levels to obtain adoption of its recommendations."

Two New Lycoming Copter Engines

The nation's first gas turbine designed specifically for helicopters is the T53-L-1 of 825 shp. The T55-L-1 which develops 1676 eshp recently completed a 50-hour preliminary flight rating test.

The T55 is the lightest American aircraft engine, 695 lbs, ever to achieve 1650-plus equivalent shaft horsepower, announced Lycoming Div., Avco Mfg. Corp.

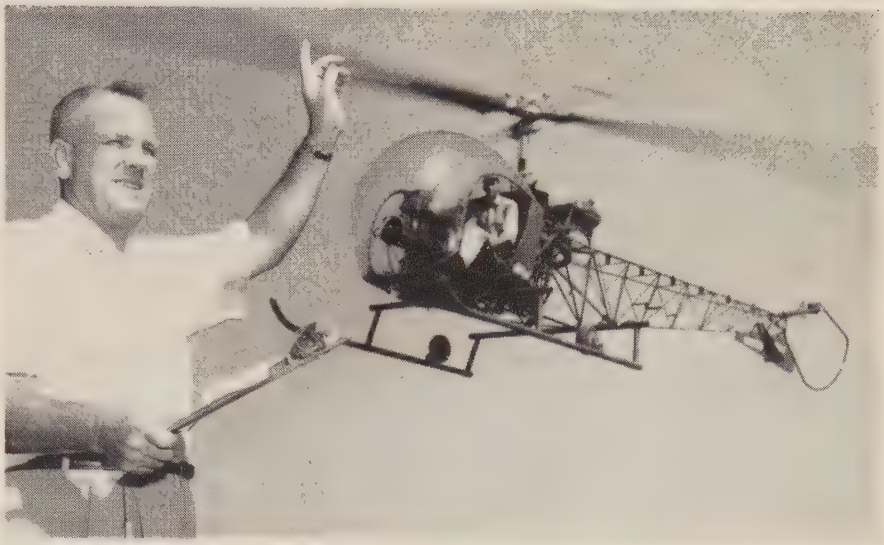
The T53 has been flown successfully in a twin engine installation in the Vertol Model 105, a modified H-21.

Chicago Helicopter Airways Increases Size Of Fleet

Two Sikorsky S-58C helicopters have been added to Chicago Helicopter Airways' fleet. Firm has total of five S-58s featuring the "Continental" style of two six-passenger compartments.

CHA president, John S. Gleason, claims the additional copters will enable the line to "provide additional service on present routes as well as expand our passenger service to suburban communities."

THE WORKING 'COPTER



ALLIED PRESIDENT, *Roy David, checks off flight of one of his Bell helicopters at Tulsa.*

Tulsa Firm Works Its Copters From Alaska to South America

Flying in weather 30 degrees below zero, out of minute jungle clearings and being "sued" by an Icelandic farmer for giving his horse a "bad disposition," are among the memorable experiences of Roy David, president of Allied Helicopter Service, Inc., of Brown Airport, Tulsa, Okla.

In its eighth year of operation, Allied was organized at New Orleans in 1949, moving to its present site in 1951. Besides David, there are Osvil (Ozzie) York, vice president; Mrs. David, secretary-treasurer; Ralph Smith, manager; and Ken Turner, chief domestic pilot.

Using their Bell helicopters, Allied has sprayed thousands of acres of timber land for control of brush in Oklahoma. The firm is anticipating the use of the Vertol 44 for lease work in Latin America in inaccessible spots where heavy equipment and personnel must be transplanted.

The Iceland incident occurred when "some of the boys" flew over a coastal farm and saw a farmer baling hay with a horsedrawn rig. When they were ready to leave the country, the fliers were told they couldn't take the helicopters with them because there was a claim against them. A long legal document written in Norwegian proved to be from the horse owner who complained that the helicopters had given his horse a bad disposition. The farmer wanted $150 to improve his own disposition. Settlement was made out of court.

Flying over thick jungle, the helicopters could cover in 45 minutes distance that took six days for natives to cover by mule and machete, chopping their way through.

They worked for uranium mining companies in Alaska. In the sub-zero winter weather the motor oil had to be heated before flights. Some of the pilots joke that the cook got the coffee pot and oil pot mixed up on the stove and the fliers drank the oil while the copter got the coffee.

Spartan—Canada's Cinderella Firm

Spartan Air Services Ltd., of Ottawa, is engaged in aerial survey operations all over the world. Its fleet of more than 50 fixed wing aircraft and helicopters operates out of bases from Calgary to Nairobi, Kenya. A wholly Canadian-owned company, Spartan offers a complete exploration, survey and pre-engineering service.

The Ottawa company pioneered high-level aerial photography after the War, and this coming summer its Mosquito 35 aircraft will start photographic coverage for the Canadian gavernment to within 500 miles of the North Pole. This latest Arctic survey contract covers an area of 220,800 square miles, the largest survey of its type ever undertaken in the free world.

Helicopter operations is a fast growing facet of Spartan's overall service. A new $250,000 helicopter plant was opened last summer at Ottawa's Uplands Airport. This plant services not only Spartan's own fleet of 23 Bell 47's, but machines of the RCAF, RCN, Department of Transport and other commercial operators. In conjunction with this, Spartan gives helicopter pilot and engineering courses.

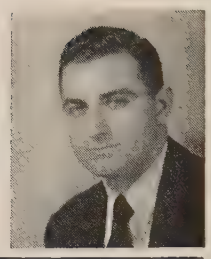
Spartan crews are also operating Vertol 42A's, the civilian version of the H-21, along the eastern section of the Mid-Canada radar warning line on a Canadian government contract. They are the first civilly licensed 42A's in North America.

To offer the variety of services it does, Spartan has a fleet of aircraft varying between Bell 47 and Vertol 42A helicopters to Lancaster bombers, Mosquito, Anson, Cessna 310, DC3 and Canso amphibian fixed wing types. Spartan's staff of 375 employees includes experienced conventional and helicopter pilots, navigators, camera operators, geophysicists, geographers, geological and aeronautical engineers.

SAFETY DIGEST

RICHARD W. GROUX, *Assistant to Executive Director NBAA*

Compiled and edited from leading air safety publications issued by military, naval, airline, government agencies and from private and business pilots' experiences.



Some Notes on Ground Effect

A Phenomenon Of Flying That Happens To Every Pilot But Is Little Understood Ground Effect Can Be A Lifesaver Or It Can Be A Killer, By Maj. Murray Marks, Office of Safety, Hq. 8AF

While ground effect is a flight characteristic about which most pilots have very little knowledge, we experience its results every time we are at the controls of an airplane. When we consider that this phenomenon affects the aircraft during takeoff and landing, and that both these critical areas account for the largest number of aircraft accidents, it is necessary for pilots to examine the subject for understanding.

What Is Ground Effect?

In part, it is the change in the airflow over the wings and tail when the aircraft is in close proximity to the ground. This change is caused by the ground surface restricting the vertical component of the airflow which normally flows down from under the wing tip, and then around it to the upper surface of the wing (wing tip vortex). The influence of Ground Effect on wing tip vortex is shown in figures 1A and 1B.

This reduced wing tip vortex results in a reduction of "induced drag," an undesirable, unavoidable consequence of producing lift.

Further consideration of the change of airflow by ground effect which restrict the vertical component is its influence on the "lift vector." This results in the required lift being produced with a reduction in the downward deflection of the airstream. The downward angle is therefore reduced which results in less induced drag because the lift vector is moved forward, shown in figures A and B.

Also interesting to note is that the percentage of wing span in relation to the height over the ground has a very definite bearing upon the amount of reduction of induced drag. Comparing two aircraft of different size wing spans at the same altitude, the one with the larger wing span will have more ground effect with a greater reduction of induced drag.

For example, an aircraft with a wing span of 60 feet starts to round out in landing at an altitude of 10 feet. Due to ground effect, it experiences a 33.9 percent reduction of induced drag. Compare this with another aircraft having a larger wing span of 100 feet which starts to round out in landing at the same altitude of 10 feet. Ground effect causes a 50 percent reduction of induced drag. This is an increase of 16 percent reduction of induced drag.

Figure C shows the reduction of induced drag due to ground effect in reference to the height relationship of the aircraft with respect to the percent of wing span.

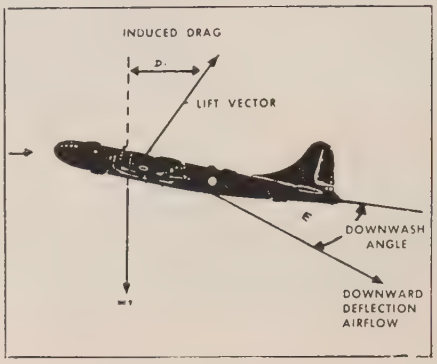
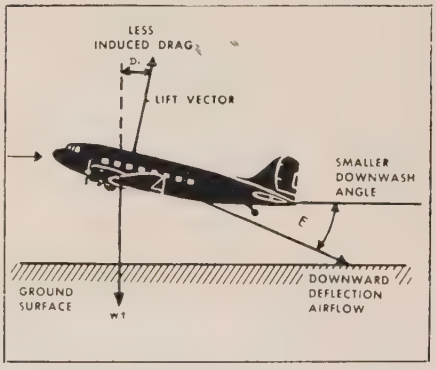


Figure A

Examination of the influence of ground effect involves two separate considerations. There are the effects on aircraft performance and the effects on aircraft stability and control.

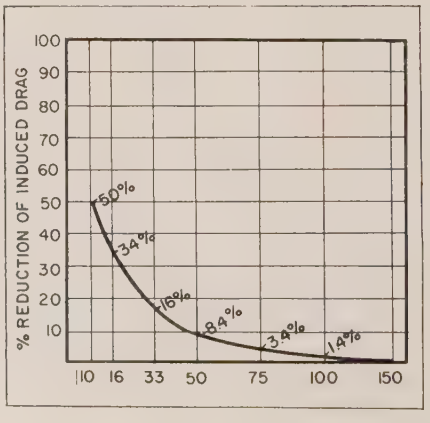
Figure B



Performance Effect

On many occasions pilots have experienced a "floating tendency" of the aircraft when near the ground, which is specially noticeable during the "flareout," in landing. This is caused by the reduction of induced drags due to ground effect as explained above.

Figure C



While "total drag" on an aircraft consists of both "induced drag" and "parasite drag," it is the induced drag that significantly is affected by ground effect. The parasite drag, or barn-door effect, which is produced by gear, flaps, dirty surfaces and miscellaneous protuberances, need not be considered for the purpose of this discussion. However, in the low speed flight regions, as in takeoff and landing, the induced drag is by far the largest percentage of the total drag.

It follows then that a reduction of induced drag will result in a noticeable reduction in the total drag. Under this condition the thrust or power required to sustain the aircraft in flight is also reduced.

Lift to Drag Ratio

For example, let's assume that an aircraft with a wing span of 116 feet is flying at an altitude out of ground effect. With a complete loss of power, the pilot attempts to maintain altitude and the aircraft decelerates at 8 ft/sec/sec or ¼ G. If the induced drag is 75 percent of the total drag for this reduced flight speed, it will account for 6 ft/sec/sec of the deceleration. In this situation the aircraft has a lift to drag ratio of 4 to 1, or L over D of 4. Therefore, if the aircraft weighs 100,000 pounds, the total drag is 25,000 pounds.

This same aircraft, flying at the same airspeed and gross weight, in the ground effect at an altitude of 10 feet in flareout for landing, would have a 50 percent reduction in induced drag. (Fig. C) For this condition the breakdown of the total drag is as follows:

	Pounds
Parasite Drag (same)	6,250
Induced Drag (50% of 18,750 lbs.)	9,375
Total Drag	15,625

As the total drag drops from 25,000 pounds to 15,625 pounds, the power off deceleration is only 5/32 G. Therefore, it can be seen that in ground effect, the aircraft would be dissipating airspeed at 5 ft/sec/sec, only ⅝ the rate out of ground effect. Excess airspeed takes longer to dissipate in ground effect and the aircraft therefore has a tendency to float in the flareout.

Lifesaver

A multi-engine aircraft may experience a partial power failure (loss of 1 or 2 engines) so that flight at altitude cannot be maintained. However, due to significant decrease in induced drag when in ground effect, this same aircraft may be able to sustain level flight

How to do 6 days work in a 5-day week

Top decision-makers in the U.S. Armed Forces and their civilian counterparts have a common complaint: there aren't enough hours in any day to accomplish all the things they'd like to do; nor enough days in any week to go all the places they should go.

That's why Lockheed built the JETSTAR—a 10-passenger "economy size" jet transport that can match the performance of the big jets at only a fraction of their costs.

In the JETSTAR you can go any place in the world in the shortest possible time, in fully pressurized and air-conditioned comfort. The JETSTAR cruises at 500 knots, above the weather at altitudes up to 45,000 feet. What's more, it's so amazingly quiet (due to aft fuselage mounting of engine jet pods) that in-flight group discussions can be held in normal conversational tones. There are facilities for desk work and dictation, sleeping accommodations for overnight flights, toilet and galley. Even after transcontinental non-stop flights, the JETSTAR delivers its passengers to their destination feeling fit and ready for work.

By taking you *where* you want to go, *when* you want to go, at jet speeds—and enabling you to work enroute—the JETSTAR can literally help you do 6 days work in a 5-day week.

The only aircraft of its kind flying today, the JETSTAR has built-in stamina that assures optimum utilization at the lowest dollar cost—a distinguishing characteristic of Lockheed military as well as civilian planes for a quarter century.

Lockheed Aircraft Corporation, GEORGIA DIVISION, *Marietta, Georgia*

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when operating in close proximity to the ground or water. This situation has been experienced many times and is a matter of record.

This is an emergency procedure and would be limited over land by terrain features. It is specially useful to know when engaged in transoceanic flights.

In many instances, aircraft, preparing to ditch, began to maintain airspeed and altitude in level flight when ground effect was entered close to the water. With power available from the remaining engines, they continued flight at this low altitude and after a period of time, sufficient fuel was consumed which reduced the gross weight. This permitted them to climb to higher and safer altitudes, and to safely reach destination.

Killer

While ground effect in landing reduces induced drag which, in turn, reduces the thrust or power required for flight, leaving ground effect in takeoff has an opposite effect. In this case, the thrust or power required for flight can be increased over that required when in ground effect.

For example, an aircraft, heavily loaded, may become airborne because ground effect makes the power available sufficient to sustain flight. However, once ground effect is left, due to the increase in induced drag, this power may not be enough to maintain flight. The aircraft may stall or "mush" back into the ground, resulting in an accident.

Importance of rigidly adhering to SOP's cannot be overemphasized. Using recommended speed for takeoff will preclude premature flight at a critical time (loss of engine on T.O.), thus nullifying the adverse influence of ground effect. This can prevent an aircraft accident.

A final consideration of ground effect is its influence on range. In ground effect, a maximum lift to drag (max L/D) ratio exists at a slower true airspeed. Therefore, with loss of drag less power is required for flight which results in increased range.

Extending range in this manner should be considered only as an emergency measure and is limited by terrain features.

Stability and Control

By comparing the downward deflection airflows as shown in figures A and B, it can be seen that the downwash is closer to the tail surfaces in ground effect. As ground effect increases, downwash effect of the wing engulfs the tail surfaces reducing the load on the tail. This results in a downward pitch at the nose.

For example, if the tail is located 100 feet back of the CG and the down load is reduced by 1,000 pounds, then the downward pitching moment would be 100,000 pounds. To prevent the aircraft from pitching into the ground, the pilots must exert positive upward elevator control to counteract it.

Aircraft designed with high tails experience very little downward pitch from ground effect because the tail is nearly out of the effective downwash of the wing.

Things to Remember

The pilot should know the following influences of ground effect:

1. *It can KILL YOU.*
2. *It can KEEP YOU ALIVE.*
3. *Accelerate in ground effect after T.O. due to reduction in drag.*
4. *Decelerate above ground effect in final approach due to greater drag.*
5. *Always use recommended speed for takeoff.*
6. *In ground effect, Max L/D is at slower TAS therefore aircraft floats.*
7. *There is loss of drag and, therefore, increased range when in ground effect.*
8. *Ground effect causes aircraft to pitch into ground and must be counteracted by upward elevator control.*
9. *There is decrease in pull stick force as aircraft climbs out of ground effect.*
10. *There is increase in pull stick force as aircraft enters ground effect.*
11. *Aircraft with larger wing span get more ground effect than aircraft with smaller wing span at the same altitude.*

Safety in Aviation
Which Approach? Better Locks On Hangar Doors, or—Knowledge?

John E. Powers, Chief Pilot
International Business Machines Corp.

When NBAA asked for my views on University of Southern California's Aviation Safety Institute, like 'Lil Abner's "Red Blooded American Boy," I agreed to volunteer.

The approach of USC to Aviation Safety is knowledge. With Don Teel, Manager, Flight Div., United States Steel (NBAA member); Chris Clark, supervisor of Flight Training, TWA, and many others, I have just completed USC's three-week course and found it a challenge . . . so much so, I feel that we in NBAA should see that at least one responsible member of our respective companies attends the institute.

The course is a six-day-a-week affair for a period of 21 days. Anyone looking for a three-week vacation in sunny Southern California had better avoid this Institute like the plague. It's WORK, and normally takes Air Force men eight weeks to complete. Plenty of information is there, and competent instructors disseminate it. But it takes an alert mind and the will to learn to get the most out of the course . . . miss a two hour session, and you've lost a week.

Dr. Louis Kaplan, director, and his select group of professors, are masters in their respective fields. The Engineering Faculty are all experienced pilots and have held positions in the major

(*Continued on page 64*)

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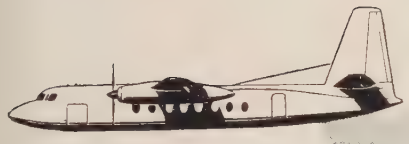

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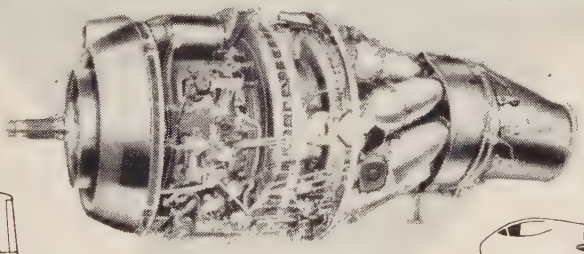
VICKERS VISCOUNT



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CANADIAN REPORT

North of the Border
By R. J. Childerhose

BENDIX RADIO EXECUTIVE CESSNA 310, *flown by Division's chief pilot, Don Grempler, is shown at Cartierville Airport on the northern fringe of Montreal where Canadair Limited is situated. This aircraft is used in dual role of executive transport and radio equipment demonstrator for Bendix equipment, getting maximum utility of the aircraft. Bendix Radio Div. of Bendix Aviation Corp. is NBAA member. Division is at Towson, Md.*

Timmins Executive Boardroom

Timmins Aviation Ltd., announces the opening of its executive boardroom at Montreal Airport, in the Timmins Aviation Building.

The room, which has been especially designed as a meeting place and conference room for "flying executives," is finished in polished teakwood panelling and matching leather. The room can accommodate meetings or receptions for 100 persons in comfort.

Featuring complete bar facilities, as well as built in equipment for the showing of films or slides, the room is particularly attractive for sales conferences. The Conference Room can be rented on a full day or half day basis. Full details are available from Timmins Aviation Ltd., Customer Service Dept., Montreal Airport.

Change in Regulations

The Department of Transport has decreed that student pilots attempting either private or commercial pilot licenses will no longer be required to demonstrate correct spin recovery technique. The change in license requirement was first announced in March of this year.

Explanation offered by the Department for the change was that most modern light aircraft are designed to be virtually spin-proof.

Seabee Mods by Leavens Bros.

For many years the Seabee has needed more wing area to help get off with heavy loads, improve its flying qualities and slow up its glide. A modification developed by a U.S. company is now fully approved and is being done in Canada by Leavens Bros., Ltd., of Toronto. It consists of extending each wing outboard by about 20 inches and attaching a wing spill plate in lieu of the rounded wing tip.

Seabee owners who have had this conversion carried out are high in their praise of the better performance. With this modification, stalling speed of the aircraft at max gross weight is decreased 6 mph, while landing and takeoff distances are shortened approximately 25% and 15% respectively. Rate of climb has also gone up by 20% while cruise speed remains essentially unchanged.

This performance data is based on tests of a standard Seabee which is not equipped with the new metal blade propeller. The addition of metal blades on the Hartzell Seabee propeller results in further marked improvements as reported by owners who now use it. With the same power settings, 10 mph better cruising speed is obtained, and with quicker takeoff with heavier loads.

Executive Jets For Sale

Vampire jets, converted into executive jet aircraft by Flightways, Inc., Westbend, Wisc., are now being offered for sale at Vancouver's International Airport. The first two of the total 25 bought by the American firm are price tagged at $19,000 and $25,000.

Powered by a single centrifugal flow Goblin II engine, the Vampire first saw service with the RCAF in 1948. The converted Vampires have had all their military hardware removed and have been given civil registry. They are offered to fly-it-yourself business executives at bargain-basement prices.

Airfields Needed in Far North

The far northwest of Canada needs more airfields, not highways, according to J. J. Byrne, president of Consolidated Discovery Yellowknife Mines. Said the chairman of Canada's northernmost gold mine:

"We hear a great deal these days about plans for the Northwest Territories, principal of which is an extensive road-building program to open up these vast areas. Our organization has had a quarter of a century of experience in the area, and it is our opinion that a part of the money be used in building a number of landing strips in strategic areas selected by the geological survey of Canada as being the most promising for mining, then build the roads to the mines after they are found.

"This is the Air Age, and this means of transportation appeals to the prospector and developer alike. As an example, our company does not have a road into the mine. In the past, supplies were hauled in by tractor during the winter months. Now however, all freight is being delivered at the mine by Bristol (air) freighter, at competitive rates.

"This could be accomplished anywhere in the Territories if airfields were established. These fields would also have a national defense value."

Mr. Byrne made the statement in Consolidated's annual report.

Business Aircraft Sales Total

Canadians were the second largest purchasers of American-built business and utility aircraft in 1957. Total aircraft brought into Canada from the U.S. in this category was 156. Total cost amounted to $2,150,000.

The five major builders of these aircraft were Aero Design & Engineering Co., Beech Aircraft Corp., Cessna Aircraft Co., Piper Aircraft Corp., and Taylorcraft, Inc. Biggest customer for the 6,000 pounds-or-less aircraft was Argentina.

Peace River Rescue

The ice-jammed Peace River of northern Alberta necessitated a round-the-clock rescue mission for four helicopters and several light aircraft which searched desperately for trappers, Indians and métis trapped by swirling flood waters.

Many isolated lumber mills situated along the Peace were inundated, with aerial rescue the only way out for workers and their families. Helicopters ranged up and down the river checking at every cabin for muskrat trappers who may have been missed.

Only a week earlier, in mid-April, the Athabasca River flooded causing millions of dollars damage to saw mills and timber lands. A Saskatchewan Government Airways plane rescued six adults and five children stranded by the flood 118 miles south of Uranium City.

SGA Pilot Al Colbeck said that waters were within six inches of the airstrip when he made the last of four trips to bring the marooned persons out.

END

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You'd scarcely know the girl after her transformation down in Dallas, Texas — the Paris, France, of aeronautical high fashion. We refer, of course, to the Model 18 Beech.

Ribbons held by Model 23 (Years) Shirley Wright tie into:

Wasp Junior engine, overhauled or exchanged.

Cockpit, with controls, instruments, radio, and interior overhauled or converted to the owner's individual needs and tastes.

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Labor prices for more than 25 important Twin Beech services are listed in our new Flat Rate catalog, proving it pays to go modern by going to Southwest Airmotive — America's quality-specialist in Beech airplanes. Write Service Sales Manager for details and immediate scheduling.

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1932 A QUARTER CENTURY OF LEADERSHIP 1958

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MARYLAND OX5'ERS *are shown in front of the Fairchild F-27 Turboprop Transport. The group visited the Fairchild Engine & Airplane Corp. plant at Hagerstown, Maryland.*

By Russ Brinkley, Pres.

Tracing former flying associates of OX5 Club members, has become one of the many interesting chores at headquarters. To date, we have probed the far corners of the universe to learn the address of missing airmen, only to learn, as in one case, that the retired pilot is living a quiet life in Toledo.

Ironically, some of the nation's best known airmen of earlier days drop out of sight, so far as the general public is concerned. One of these is Elliott White Springs, the World War I airman, who wrote "Warbirds," the thrilling feature which helped launch Bernarr MacFadden's LIBERTY magazine, more than 30 years ago. The versatile Springs now heads one of the nation's most prominent textile establishments in Fort Mill, S.C.

In the Carolinas, too, a gentleman farmer, who, as a Navy pilot, won lasting distinction for his various aviation activities. Later, as a civilian flyer, he earned even greater laurels. Today, anyone seeking Al Williams will find him enjoying life at his rural home near Elizabeth City, N.C.

Most difficult to find, and the person most sought after, was the flying author, Cloyd Clevenger. His present address is nearly as long as his flying career and boils down to: Care of Captain Florencio Reyes, Calle Sandorenzo, No. 924, Colonia del Valle, Mexico, D.F. A shorter name and address remains the plight of Karl Ort, the bearded aviation merchant, whose address is still plain York, Pa.

A famous woman flyer is Phoebe F. Omlie, who now operates a hotel and restaurant at Lambert, Miss. She and Fred Key, of Meridian, led us a merry chase as to their whereabouts. Fred is one of the famous brothers of endurance flight fame. No name is better known in aviation than Grover Loening, who recently signed on from Key Biscayne, Fla. Alfalfa cutter PeeWee Horstman of New York was discovered to be an airline pilot in Kansas City, and the flying dentist, Doc Jim Owens, surprised everyone when he was found at his lifelong address, Asheville, N.C. Now we've located Igor Sikorsky at Stratford, Conn., to become member No. 5000, Gen. Curtis LeMay looks forward to receiving card No. B-5200.

more **power** greater speed

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NEW for '58 is the Mark 20 A with a 180 h.p. engine by Lycoming—the famous name of all aircraft engines.

NEW . . . cruise at 180 m.p.h.

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NEW . . . more room for every passenger . . . insuring perfect, relaxed comfort for all.

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Seeing is believing and flying a Mark 20 is the clincher! YOU be the judge . . . compare and discover . . . the Mark 20 for 1958 is at your distributor now. For information write:

MOONEY AIRCRAFT inc. Kerrville, Texas

Circle No. 23 on Reader Service Card

The Law Behind the Skyways

by Howard Newcomb Morse, ***Counsellor at Law. Member of the Bar of the Supreme Court of the USA***

Is a Seaplane Subject to Admiralty or Aeronautical Jurisdiction?

Summer is with us. Water-borne air taxi operators are busy on their commuter runs; fish and lumber spotting pilots are following the receding ice northward, and Skyways feels that business operators of amphibious aircraft will find this subject timely.

In 1921 in the case of Reinhardt vs. Newport Flying Service Corporation Judge Benjamin N. Cardozo of the Court of Appeals of New York established the "duality of purpose" test for determining whether a seaplane is subject to admiralty or aeronautical jurisdiction. According to the "duality of purpose" test, a seaplane is under admiralty jurisdiction while on the water and within aeronautical jurisdiction while in the air.

Judge Cardozo declared that a seaplane "while in the air, is not subject to the admiralty . . . or so at least we may assume, because it is not then in navigable waters, and navigability is the test of admiralty jurisdiction," but that a seaplane "while afloat upon waters capable of navigation, is subject to the admiralty, because location and function stamp it as a means of water transportation."

In 1922, one year after Judge Cardozo's opinion, the Supreme Court of New York (which is inferior to the Court of Appeals of New York) in the case of People ex rel. Cushing vs. Smith did not follow the "duality of purpose" test formulated by Judge Cardozo, but rather established a new and different "primary purpose" test.

According to the "primary purpose" test, a seaplane is subject to aeronautical rather than admiralty jurisdiction because its "primary purpose" is to navigate through the air rather than on the water.

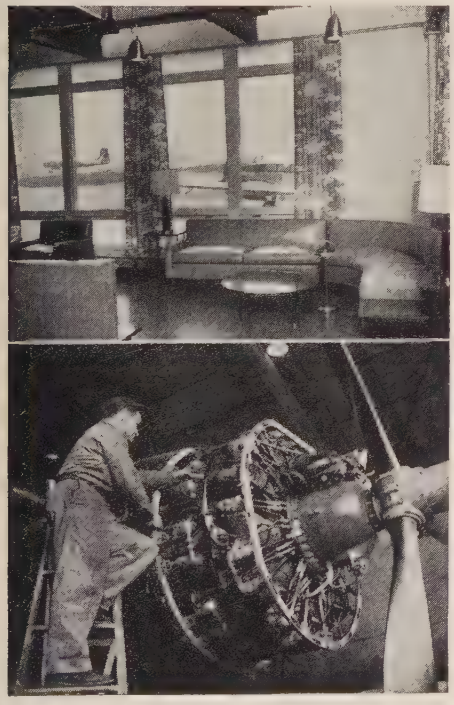
The Court stated that: ". . . a seaplane . . . floats. It also flies. It floats only for the purposes of harborage and of rising. When in actual operation, it is in the water but a small fraction of the time. After the engine is started, the plane is upon the water for from 50 to 300 yards, when the air becomes its habitat. It may go a few miles, or hundreds of miles, before resting again upon the water."

The "primary purose" test formulated by the Supreme Court of New York in 1922 was subscribed to by the District Court of the United States for the Southern District of New York in 1939 in two cases: Dollins vs. Pan-American Grace Airways, Inc. and Noakes vs. Imperial Airways (Bermuda) Ltd.

The Court in the Dollins case declared that while a seaplane "must effect its ascent either from (and likewise its descent upon) water or land, its real purpose is to navigate through the air, although it may operate on the water in a smooth sea, but that is purely an auxiliary function."

The same Court in the Noakes case stated that: "The primary purpose and function of the Cavalier (the particular seaplane involved) was to travel through the air. It was practically incapable of being used as a means of transportation on water, although its construction enabled it to embark on its journey from the sea and to alight on the water when it had reached its destination, but this was purely incidental to its flight through the air."

The law is thus settled that a seaplane, because of its "primary purpose," is subject to aeronautical rather than admiralty jurisdiction. END



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in the business hangar . . . .

■ **PIEDMONT AVIATION, INC.,** Winston-Salem, N.C., completed a 100-hr inspection on Management Service's DC-3. Pilot is "Hap" Wilson.

Miller Equipment Co. flew their Bonanza in for Tactair Auto Pilot installation.

Studebaker-Packard Corp.'s DC-3, flown by Bill Abram, chief pilot, in for 100-hr inspection and landing gear overhaul.

Chrysler Corp.'s DC-3 was in for a 4,000-hr inspection, short stacks, minor cowling and complete heater rework.

Carrier Corp.'s DC-3 was in for engine change and 100-hr inspection. Pilot, Floyd Graham.

Long Mfg. Co.'s Aero Commander in for engine repairs and radio work. Pilot is Steve Donegan.

S & W Motor Lines' D18S had engine change and miscellaneous repairs.

L. A. Marsden's "J" model Bonanza had a Tactair Auto Pilot installation.

■ **PACAERO ENGINEERING CORP.,** Santa Monica Airport, Calif., completed misc. work on Avco Mfg. Corp.'s Learstar. Bailey Case is chief pilot; Hank Inselman is co-pilot.

Utah Construction's Learstar was flown in for misc. service. Chief pilot is Doug Garneau, co-pilot, Jim Wisman.

Sinclair Refining Co.'s pilot, Hugh Wells, brought in their Learstar for flap and autopilot repair work.

Warren Petroleum Corp. had work done on their Learstar. Stan Nicola and Bill Reif are the pilots.

■ **VAN'S AIR SERVICE, INC.,** Winona, Minn., gave periodic inspections to the DeKalb Agricultural Assn.'s Aero Commander and Navion, plus radio installations.

The American Legion 680 Aero Commander received a 100-hr inspection.

Ray O Vac Co.'s 680 Aero Commander, Bill Allen, pilot, received a 100-hr inspection. (NBAA member.)

The J. R. Watkins Co.'s DC-3 and Cessna 310 received periodics. (NBAA member.)

■ **GREENSBORO-HIGH POINT AIR SERVICE, INC.,** Greensboro, N. C., completed work on Apache of television station WJBF of Augusta, Ga., including 100-hr inspection, new paint, Air Service custom interior, dual Omnis and Wright 90 channel communication. J. B. Fuqua, president, flies the Apache.

Gardner Enterprises' D-18 Beechcraft was in for radio work. J. M. Gardner is pilot.

H. L. Coble Construction Co.'s Twin Bonanza, Roscoe Harris pilot, was in for 100-hr inspection.

■ **SOUTHWEST AIRMOTIVE CO.,** Love Field, Dallas, Tex., completed a 1,000-hr inspection and major overhaul on Venezuela Atlantic Refining Co.'s D18S Beech, brought in by Pilot Jessie Reese.

Aeroquip's Aero Commander 680 was in for double engine change and 100-hr inspection. Pilot is Don Westfall.

Chalmers and Borton's E18S Beechcraft was in for repairs. Pilot is G. I. Jones.

■ **NEWARK AIR SERVICE, INC.,** Newark Airport, N.J., gave Engelhard Industries, Inc.'s Lockheed Lodestar (Dick Buehler, Director of Operations, L. J. Van Manssart, Chief Pilot) a 100-hr inspection and interior refurbishing.

American Gilsonite Co., Salt Lake City, Utah (D. P. Olin, Chief Pilot), Lockheed Lodestar underwent a 100-hr inspection.

Airmar Radio Service, Inc. has new operations branch at Newark Air Service, Hangar No. 12.

■ **REMMERT-WERNER, INC.,** installed Hartzell three bladed props on Gaylord Container D18S during a 1000-hr inspection and overhaul of wings and gas tanks. Pilots are E. B. Brown and Bob Pierce.

Pocahontas Coal Co.'s D18S came to R-W, Pompano Beach, Fla., for installation of speed kit, new interior and other work. Bob Amundsen is pilot.

The Mine Safety Appliances Co. DC3 had 1,000-hr inspection and overhaul, control recovering, interior work, installation of Collins 51Z marker receiver, Bendix marker receiver, Bendix iron core loops, radio overhaul, woodwork refinishing, and other rework. M. L. Nicholson is chief pilot.

■ **SPARTAN AIRCRAFT CO.,** Tulsa, Okla., performed general inspection of propellers and overhauled the engine accessories on Eaton Mfg. Co.'s Beech E18S, flown in by Nick Schemensky.

Mechanical Products' Lockheed Ventura had miscellaneous repairs. Arthur Knapp is pilot.

Champion Paper and Fibre Co.'s Lockheed Ventura, piloted by R. W. Smith, received misc. aircraft, instrument, and radio repairs.

■ **GARRETT CORP.'s AIRESEARCH AVIATION SERVICE DIV.,** Los Angeles International Airport, is installing Bendix RDR-1B radar, Lear C1S-100 flight system and new type pilots' chairs on Timken Roller Bearing Co.'s B-25. Also making an engine change and re-painting exterior including use of Day-Glo rocket red striping for easier visual identification in flight. Crew consists of George Dipple and Jake Kindsvater.

■ **TIMMINS AVIATION LTD.,** Montreal Airport, Que., Canada, completed 100-hr inspection, installation of ARC 15 D Omni, ARC CD1, Course Director and DARE 360 channel transceiver on DeHavilland Dove of Federal Equipment. Pilot is Bill LeSauvage; co-pilot engineer, Dave Haines.

Canada Packers' Lodestar was in for de-icing modifications, modified cowl flap installation and inspection. Ted Lawrence and Bill Vehey are the pilots.

Inter-American Minerals' B-25 was in for major servicing and refinishing.

Noranda Mines Ltd.'s Lodestar had 400-hr inspection and double engine change. Pilot is John Weston; co-pilot, Dick Taylor.

■ **DAN DECKER AIRMOTIVE,** Phoenix, Ariz., completed annual inspection on Aero Commander of Producers Cotton Oil of Arizona. Lloyd Hendon is pilot.

SPARE PARTS PROBLEM

In this day of specialists, even spare parts come under the heading of *specialized supplies.* Accessory items designed to meet aviation problems of size and weight are difficult to stockpile without acquiring an unjustifiably expensive inventory. The result is that fixed base operators find it better to contract with a firm that concerns itself particularly with such a specialized inventory.

Fast growing in this field which includes names as Air Associates, Durham, Van Dusen, Airwork, etc., is a name that has become a by-word with busy fixed base operators in the East.

UNIPAK Aviation Corp. of Long Island City, N.Y., has a national dealer network with more than 25 aircraft service and maintenance shops.

It is anticipated that eventually more than 50 such shops will service their customers with factory new or rebuilt certified parts under a "call upon" demand priority system, obviously reducing considerably "down times" of busy business aircraft.

Also, the firm will exchange certified type accessory units or, if preferred, overhaul the plane owner's unit.

Large business air fleet operators, as Union Carbide, U.S. Steel and General Electric, who maintain their own shops, also find this type of specialized parts service an advantage over long negotiations with the factories.

HORTON & HORTON DESIGNS PASSENGER FREIGHT CONVERSION

First of four new DC-6As for Overseas National Airways is inspected by George W. Tompkins, left, Overseas president, and D. W. Rentzel, Slick Airways president. Horton & Horton Custom Works, Inc., Fort Worth, Tex., is doing the conversions of the planes which arrive with bare freight interiors and leave with complete passenger facilities including stressed baby bassinets and crew bunks. The DC-6As are for trans-Atlantic trips.

Circle No. 58 on Reader Service Card

Arizona Public Service's D18 Beech had tail modification. Pilot is Paul Petris.

Tovrea Land and Cattle Co.'s D18 Beech had miscellaneous repairs. Lee Schellenberger is pilot.

Jack Harris Inc.'s Apache had 100-hr inspection.

(Continued on page 50)

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Built-In Serviceability

(*Continued from page 28*)

During the astronomical growth of the company since then, Lou has surrounded himself with a team of experts, all of whom think the same way as a result of long years of service experience. Vice president is Albert Sherwat; chief engineer, Burl Martin; sales manager, Elliott Polansky; commercial sales representative, Henry Reichelt; and service manager, O. R. Burnett.

As the airways and radio congestion problem zoomed in the early 1950's, many aircraft owners and business operators found their communications equipment threatened with premature obsolescence for reasons of insufficient channels.

Dare's first and immediately popular product was the now well-known MicroTuner VHF receiver, developed as an answer to the sudden and urgent need for a dependable auxiliary piece. Pitinsky engineered a slip-proof worm-gear mechanism that gave pilots throughout the nation renewed confidence in their equipment. The success of the MicroTuner enabled Dare to double their business in 1954. Since then Dare has put a major portion of its profits back into development, research and preparation for future expansion.

During the past few years, their most popular product for business plane operators is their compact 23-pound, 360-channel VHF transceiver which meets CAA TSO C37 and C38 requirements.

Of special interest to the small business aircraft pilot-owners is the Dare 22-channel transmitter which has a full coverage from 118.0 to 127.0 megacycles and a 3-4 watt power output over the entire range. The Dare modulator power supply package includes a dynamometer, filter, components, transmitter speech amplifier and modulator. The Dare omni converter contains a built-in localizer which enables a changeover from omni to LOC by a flip of the receiver switch. The Dare navigation indicator is a combination course selector, left-right indicator, and to-from indicator, and is available with glide slope presentation. The company offers a complete catalog of communication and navigation systems and is proud of the fact that they manufacture everything in the catalog.

Visiting their plant at Troy, it was a pleasant experience to sense the attitude of teamwork and ambition that pervades the entire organization from their pretty receptionist through the engineering, research, manufacturing, testing laboratory, down to the stockroom in the elaborately equipped machine shop in which they make many of their own tools. Elliott Polansky informed us that much of the testing equipment they developed for their own use is now being manufactured and marketed for use in other plants.

The high degree of precision insisted upon in their products is reflected in the clock-like efficiency of the 175 employees. Evidence of the confidence

CONTROLLED ATMOSPHERE *room is used in assembling instruments in dust-free air*

that the company is really going places is the comparatively large amount of space and equipment devoted to future research and development.

To assure a product of highest possible efficiency, Dare's equipment is put through every test imaginable. All incoming tubes to be used are aged eight hours to assure peak performance when incorporated into Dare sets.

"We try to be as certain as possible that every outside component measures up to our standards of reliability," Polansky told us.

He then showed us how every Dare set is put through a series of below-zero, 150-degree hot, and vari-speed vibration and shaking tests. "It saves us trouble in the long run, because if they aren't perfect now, we will have to perfect them when they are returned," he said.

Transmitting equipment is aligned and tested in several copper-screened cages to control radiation. Complete humidity and temperature control is maintained in all vital departments. Further bearing out Dare's policy of serviceability is their tremendous reserve stock of parts which make replacement possible in a matter of hours from any part of the country.

More than seventy major distributors round out the sales-service network of this energetic organization. Building maximum utility equipment with minimum weight, with very special emphasis on serviceability, seems to be the extra that have meant success for Dare. A peek at some of the products now under development indicates that the company is not resting on its laurels. Large manufacturers should note that Dare has purchased a five-acre tract next to their building for expansion.

Business Hangar

(*Continued from page 48*)

■ **EXECUTIVE AIRCRAFT SERVICE INC.,** Dallas, Tex., completed:

Dow Chemical Co.'s DC-3, piloted by Russell Purchase, had annual inspection, misc. repairs and installation of radio equipment, aileron gap cover, and new cabin carpet and side panels.

Kerr-McGee Oil Industries, Inc.'s DC-3 was brought in by Chief Pilot Ken Hunter for 8,000-hr inspection and overhaul, and installations of Bendix radar, Barber-Colman temperature controls, complete new electrical system, 200 amp generator system, and Baggagemaster door.

Wm. H. Messick brought his Luscombe in for annual inspection and misc. repairs

Fixed Base Operator Increases Size of Rochester Facility

One of business aviation's popular headquarters is at the Rochester-Monroe County Airport, Rochester, N.Y. Adding to its long record of service to aviation, Page Airways, Inc., now has as a new hangar which increases existing facilities by 15,000 square feet.

Founded in the early 1930's by James F. Wilmot, the company took the name of its chief instructor, Elmer Page. History of the NBAA-member firm reveals that it graduated hundreds of military service pilots during World War II from its Lafayette, La., base. During this period the home office engaged in the Civil Pilot Training Program.

Foreseeing the future in business aviation, Wilmot, president of Page, and his brother Gerald, treasurer and general manager, became distributors for Beech Aircraft and Collins, Wilcox, ARC, Lear, Dare and Wright electronics manufacturers.

The first radar installation in a business aircraft was completed by Page, and the original engineering and installation of radar in Lockheed Lodestars and Venturas was done by the firm. In charge of the electronics department is Don Ladd.

Large business aircraft, as the DC-3, Martin 404, Lockheed, Twin Beech and Viscount, as well as smaller single engine planes, are taken care of in the general maintenance hangars. More than 20 mechanics are engaged in conversion, inspections, re-licensing and allied work. The sheet metal shop, machine shop and stock rooms join the main hangar. There may be a variety of planes being worked on at the same time. John Wilmot, third brother in the firm, is in charge of this department.

Besides the new hangar, plans for a new pilot and passenger lounge have been approved, and construction is to start soon. This addition will include direct telephone lines to the weather bureau and communications for flight plans plus a teletype machine for weather sequences. A roof top patio is under construction for the warm weather comfort of waiting crews and passengers. Courtesy cars are available for visitors. Catering and reservation service are part of Page hospitality.

With a persistent faith in the future of business aviation the three Wilmot brothers are banking on their experience gained in 20 years of service to continue a program of expanding service to corporate and private aircraft owners and crews.

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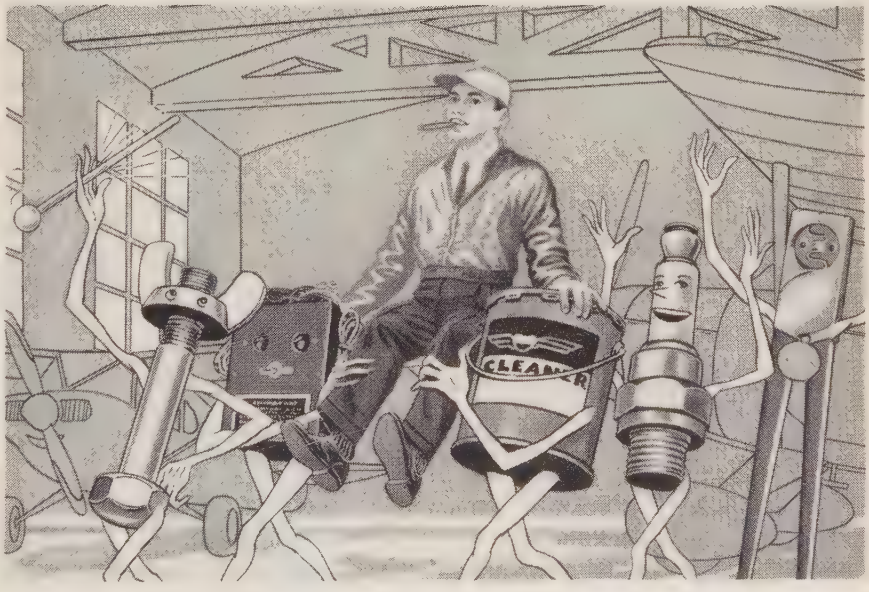

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LIFE

(*Continued from page 15*)

Recalling that most first-time airorne neophytes, and many starting inrument students, apply "body Engsh" against the bank, the LIFE indiator provides a sort of psychological udge to lean into the turn and go with ıe instrument—a pleasant experience.

Our clearance read via the 114° ıdial of COL VOR to intercept V-16 ver the water. At 3,000 at Woolf and ully intersections, we figured it wasn't ossible to get much weaker signals om Coyle and Riverhead omnis (52 nd 66 s.m. away at midpoint) to steer om and work a course computer gadet on, but the LIFE system wasn't ızed one bit, and frequent radar checks om the Center radar controller conrmed our navigation every inch of the ay. Again, the transition from the 14° of COL to the Victor 16 was sheer elight. We were glad ATC was "look-ı'." You don't always feel that way. s Bill Lear says: "Does Radar emarrass you? Try LIFE!"

As we churned up V-16 at about 230 ue, life was not entirely serene. We ere determined to show off our "toy" nd checked every conceivable interection without the Center's request. hey weren't idle either. Maybe they ere using the occasion (CAVU) to heck out a trainee on giving impossible requencies to business aircraft because ney changed frequencies on us at least ve times between first contact and the me we cancelled IFR past Riverhead. ut we fooled them; Lear's 800-channel ansceiver had every possible one.

We had a little trouble raising the enter after overheading RIV to cancel ur IFR, but an airline crew was courous to relay (we were 5 x 5 with him). lowever, if the communications were eak at this point only, the computer idn't know it because we could operte on IDL VOR even if we couldn't alk to the ATC receiver at Douglaston, .I., at our altitude.

Quite pleased with the computer opration in enroute problem solving, we ırned to MacArthur (Islip, L.I.) Field or an ILS shot. After clearance for a ow approach, we abandoned the full engthy procedure turn technique for a horty from almost directly overhead ıe Middle Comlo. There wasn't time o do more than keep the Course "bugs" ined up and the airplane symbol on the Glide Slope "bugs" once we departed he course on the outbound heading. The maneuver could hardly have been escribed as comfortable, but darned f we didn't come out quite well lined p for the runway (despite a stiff crosswind) just after passing the middlearker. In an emergency, this would ure be the quickest way to get down f you couldn't afford a miss as the esult of a too short approach! It was surprise that MAC Tower didn't call is on it "in difficulty?" But I guess hey see some queer ones in the thouands of practice approaches they acept from every operator in the New ork area where practice approaches ıre virtually taboo.

At this point we went to Westchester County Airport for a change of scene and another practice shot. This time, we deliberately placed the Aero Commander on an intersection with the ILS that anyone could see was too close and off the heading for a direct turn-on manually. I fully expected when we engaged the LIFE to the autopilot to get a repeat of the violent maneuver we had executed earlier at ISP.

But the system was smarter than the human, and it was quite an experience to see this electronic "George" sample the situation briefly, then deliberately turn the airplane away from the localizer course and make a very neat, smooth, almost constant bank procedure turn to intersect the course properly and tie it down well before the Outer Marker. I took it off autopilot after first overpowering it and placing us in a position where the AP was acting to return. The moment I hit the disconnect button on the wheel, the little "command index bug" on the outer perimeter of the NAFLI swung over to lead us manually into the proper angle of bank and heading to make a smooth intercept, and this one was right down the painted stripe!

After being exposed to the facts of LIFE, I felt it would be a real comfort for any pilot to have LIFE in the cockpit on a rough, dirty instrument night.

Back at Teterboro, we asked Lois Henry, publisher of Skyways, to take over the controls for the last ILS approach. Because of the ease of operation made possible with the LIFE presentation, she grooved Runway 6. There was only one catch to it. As soon as the men in the tower heard her voice on the radio and realized it was going to be a woman driver, the pattern suddenly was too busy for a practice letdown, so she had to maintain 1,000 feet over the runway on the approach. As Lois put it, "That's LIFE!"

(*At press time Bill Lear comments. P. 63*)

Squall Lines—Thunderstorms —Tornadoes

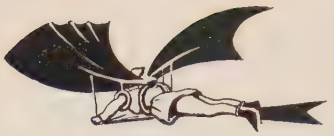
The *best* advice concerning these—is avoidance. Much progress has been made in the past few years to make this possible. The Severe Weather Warning Center at Kansas City, Mo., is now able to successfully forecast, detect and track about 90% of the severe weather reported in the continental U.S.

This information is made available to aircraft in flight via Flash Advisories broadcast over CAA INSAC Stations. It is also included in scheduled weather broadcasts and is given to pilots when they contact a station for ATC purposes.

TWA also broadcasts thunderstorm information from the following locations each hour on the hour.

ABQ—*128.9;* 6834.5; 5484; 3495.5
MKC—*129.3; 128.9*
IND—*129.3; 128.4;* 2896; 5596.5

It has been requested that these frequencies be *monitored only*—avoiding requests for information which would interfere with normal company communications.



As early as 1483, Leonardo Da Vinci, before turning his attention to serious painting, conceived and sketched several flying devices. This ornithopter design is from one of his drawings as it might have looked had it been able to fly.

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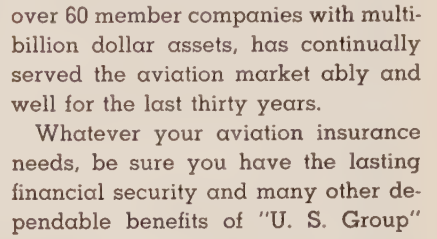

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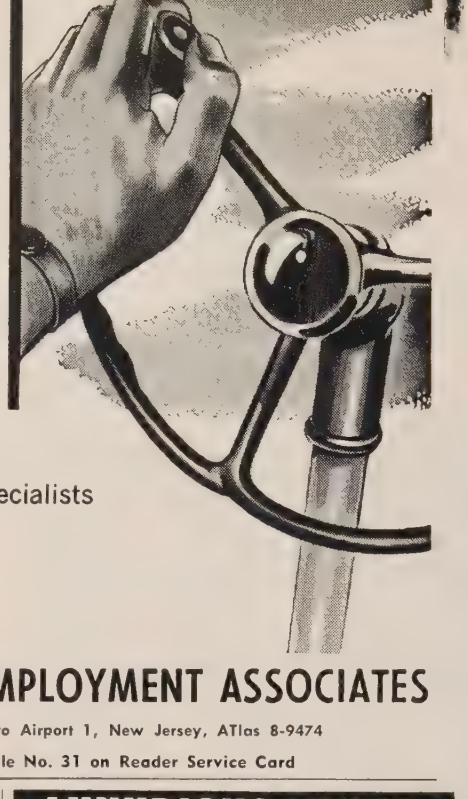

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IN THE JULY ISSUE YOU'LL READ
- A Pilot's Report on the Superior Satellite
- How Business Pilots Train at Embry-Riddle

Travel Air

(*Continued from page 17*)

pressure, flaps and wheels up. I deliberately pulled up into a steep angle of attack, in spite of which my recovery was straight ahead with minimum loss of altitude. In power stalls there's an excellent warning in the form of a mild but steady buffeting which develops at 5 mph above stall speed. Buffeting also occurs just ahead of power off stalls.

Power, flaps and wheels down, stall speed was as low as 55 mph—a fine indication that this craft will be an outstanding small field airplane. I figured that the stall speed "dirty" and no power, at our weight, was just about 68 mph. Travel Air stalls are extremely gentle and very easy to handle. Even with the wheel all the way back, there's little tendency for either wing to go down. If one does, you can bring it back up with aileron.

At about 5,000 feet, I dived at 200 mph indicated and found the controls exceptionally well balanced. Even in high speed turns, I had no feeling of insecurity or excessive weight on the controls.

The manual says 150 mph indicated is the limit for a gear to drop, but if necessary it can be done safely at 200. In fact, with hands and feet off the controls, you can drop the gear at 175 and the airplane will pitch up slightly, instead of down, as I would have expected. It will then climb until the air speed drops to 150, at which point it will nose down slightly below level until you reach 180, then back up very slowly—still with hands and feet off.

For my first landing I headed in with about 13 inches and 100 mph in trim. I dropped a little flap and found very little change in trim. I flared out just over the approach end of the runway and touched down at about 70 mph.

Mason Sheehon, an old Navy buddy of mine, of Beech's military sales team, arranged for me to fly with him on a regular delivery pick-up hop non-stop from Pensacola to Wichita.

Although this was a VFR flight plan, the undercast simulated very well conditions under which many instrument flights are made. We finally ran out from over the undercast at Fort Smith into some turbulence where I received the most pleasant surprise of the trip. There was no tossing around but plenty of good, solid directional control—even without my feet on the rudder.

Our overall ground speed for the 776 miles was 194 mph. Got a good check on fuel consumption in that we were exactly 3 hours and 5 minutes on the two auxiliary tanks which hold a total of 60 gallons. This works out to just under 20 gallons an hour at about 60% power. For a twin-engine aircraft that spells operating economy in capital letters!

Quite frankly, I looked for deficiencies in the Travel Air, yet I found nothing of consequence to criticize. It appears that Beech has given business aviation another flying thoroughbred.

3 planes flown by company executives fully insured with INA's extra value

The gentleman stepping into this company plane is Richard O. Wilson, President of the Wilco Machine Works, Inc., of Memphis. He flies the plane himself, as do the other top executives at Wilco.

The company owns three planes: two late model Cessnas and a Piper Apache. All three are fully covered by hull and liability insurance tailored by Insurance Company of North America, the nation's leading independent underwriter of aviation insurance.

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Roundtable

(*Continued from page 36*)

Fuel Additives

Haxby: The majority of this group is familiar with the fact that tetraethyl lead is added to a fuel as a most economical means of increasing octane or performance number to make the greatest amount of fuel available at the cheapest price to the operator. As tetraethyl lead is added, it is necessary to scavenge the residual lead after combustion, and various substances such as the bromides are used for this purpose. This has always led to certain problems as deposits in a combustion chamber, spark plugs and, in minor cases, in other areas of the engine. At present we see no relief from the tetraethyl lead-bromide situation. As Smith of Wright Aero has said, there are other additives in the wind. Generally, as each new additive is introduced, it often is accompanied by other side effects which have to be checked out very carefully.

You may be interested in a few other things that we see as potential fuel additives. The Ethyl company in connection with Wright Aero has announced an additive called AK33X which is intended to improve further the performance number of fuels.

G. C. Pomeroy (*Swiftlite Aircraft*): What is the engine manufacturer's opinion of using a higher fuel for any rated horsepower engine?

Smith: Our policy on the use of higher octane fuel is that you can always go higher in octane but never lower. As you go to fuels of higher lead content you may get into difficulties due to increased deposits, but as far as engine output is concerned, it's perfectly all right to go upwards.

Foster: The CAA and engine manufacturers recommend and certify primarily on a given grade. This becomes the minimum octane on which the engine is approved for operation. The next alternate grade to use is the next higher grade. Nobody ever recommends use of lower than minimum grade. Pratt & Whitney's feeling on deposits are commensurate with extra difficulties experienced with the extra lead which may be involved, but they have no objections to using the next higher grade. Their argument on the CB17 DC6B engine against the use of 115 on a continuous basis versus the 108 was based primarily on this difference in lead. If you look at fuel specifications for all grades, they are the same with the exception that they are colored differently, there are different amounts of lead in them, and they have different octane numbers. Every other significant property of the fuels is essentially the same from one grade to another.

E. P. Kovac (*Lockheed Aircraft Service*): Landi mentioned that TCP has some harmful effects on their engine. What are they?

Landi: It wasn't definitely attributed to TCP. It was just our opinion, and it's based on what we found in the valve seat areas of our removed cylinders at top overhauls.

Foster: If you have lead fouling of spark plugs, TCP will help you. If you have an Inconel, stainless, crossover, extensive exhaust system, you might get some high temperature corrosion. If you have an exhaust turbine blower, as on the Stratocruiser, you might also get into some deposit problems. Essentially TCP will help most on plugs. We sell it mostly for helicopter operations. I'm surprised to hear that you feel that you've had some bad side effects from its use in your Bells. Most Bell operators we know of use it because of additional plug life . . . for example, four hours without it and 20 hours with it.

R. L. Anderson (*Champion Spark Plug*): Something of importance to be considered here is the fact that in the newer engines that are now going into service in the smaller aircraft, the engine manufacturer has been called upon by the aircraft manufacturer to furnish more efficient engines of higher horsepower and lower weight. The natural trend by the engine manufacturer to accomplish this has been toward working his cylinders at higher pressure requiring the higher octane, higher leaded fuels. Use of these higher leaded fuels in engine types by persons lacking background and experience in handling T.E.L. has brought on some operational difficulties in the field. It's natural that spark plug manufacturers are the first to get blamed for the spark plug trouble that goes with it.

There is good evidence to believe the engine manufacturers fully recognize this basic problem in handling T.E.L. The new engines that are being brought out for future aircraft are showing trends in the direction of having the ability to handle lead much better. I think it is only a matter of time before higher leaded fuels will be taken in stride without operating difficulties.

Campbell: Don't you think, also, that you could isolate the helicopter application from the straight tractor installation? We have found that to be so ignition-wise. We manufacture the magnetos and ignition system for the helicopter installations. It is more difficult for engines to give performance that have a straight tractor installation. You are confronted with a different cooling problem on the helicopter. It makes it a little more difficult to perform than it does on some straight installations.

Anderson: I think as a whole, the helicopter operation has been more severe on the engine and the ignition system components. It is a vehicle that depends strictly upon engine power to fly. Some early designs were fighting for adequate horsepower with low weight. Some of the earlier installations the engines operated at an extremely high percentage of their total power. Some of the later helicopter installations, because of more efficient design of the vehicle itself, are getting engines installed in conditions where they are not worked at such a high percentage of power. On some of these later installations the spark plug operating problems are not much different from those we find on other aircraft.

Campbell: Cooling has been and i being improved, also, and we believ that will help.

Mecca: I think one of the factors tha contributed to this spark plug problen is that the helicopter engine, beside drawing a big percent of its powe when flying, is also flying short hauls brief flights and is operating at lov manifold pressure, high speed a large percentage of this time. During warm up, it is not uncommon for a helicopte engine to run 3100 rpm at 10 inches or less, of manifold pressure. This does not enhance its oil consumption char acteristics by any means.

Beyond that, the helicopter seldom flies at much altitude. It is usually just off the ground. It is never outside the dusty area. So, with high speed and low manifold pressure, we have the ab normal aspiration of dust, and we find ourselves with a perpetual problem It is solved to its present degree by redesigning the manifold and by in stalling good air filters in the induction system. The next step will be to use the 18mm rather than the 14mm spark plug. The 14mm was adequate for the 80 octane conventional installation bu is not yet 100% satisfactory for the helicopter engine.

Fouling Characteristics

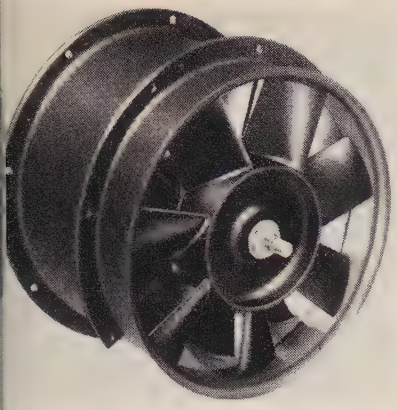
Campbell: Let's go on to fouling char acteristics and how to eliminate them We still have quite a problem with foul ing, and we feel that back in the igni tion system they don't get as much abuse as the fellow does out on the business end of the spark plug.

Anderson: We fully recognize the nee especially in the smaller aircraft fo spark plugs of better ability to handl operational variables. Not many year ago most flying was done as a hobby The fellow doing the flying was quit zealous. He took considerable pride in his knowledge of the aircraft to the extent that he was able to do a certai amount of overhaul and service on the aircraft and engine. This is no longer the case.

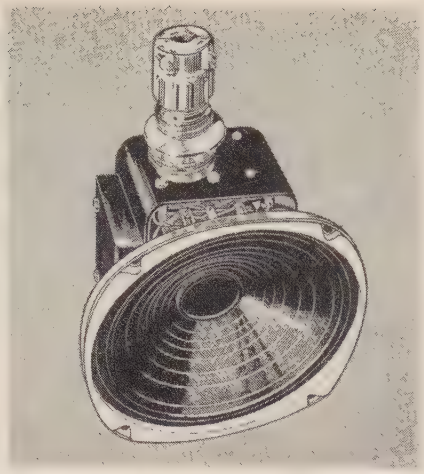
We must realize today that the air plane is now accepted as a faste vehicle of transportation. The pilot who fly most of the small aircraft care little what makes the thing tick as a piece of mechanical equipment. The result is a severe demand upon the engine and equipment manufacturer We must be able to deliver a piece of equipment that will operate very much in the same order as a modern auto He climbs aboard, starts up and goes He should not have to give particular attention to this and that to keep it out of trouble.

As to spark plugs and their additive fouling, we must be able to give them better anti-fouling qualities. Our engi neering designs are trending toward building plugs of better anti-fouling quality. We don't believe we can as sume the responsibility 100% for cor recting the problem. We think that some of the responsibility must be assumed by the engine manufacturer

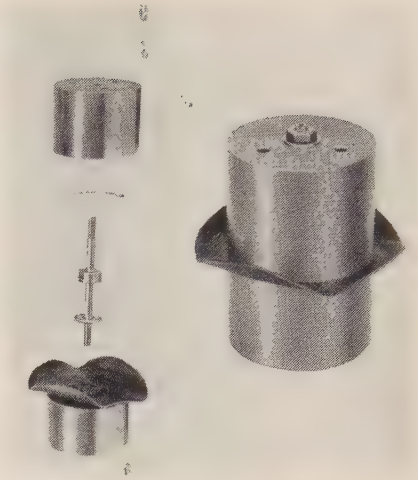
(*Continued on page 59*)



Fan Cools Helicopter Oil

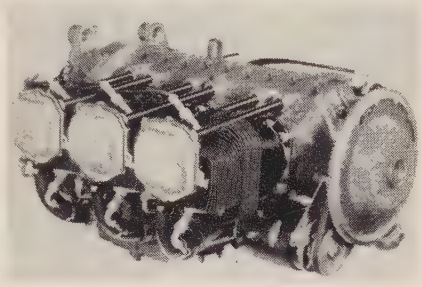


Amplifying Speaker

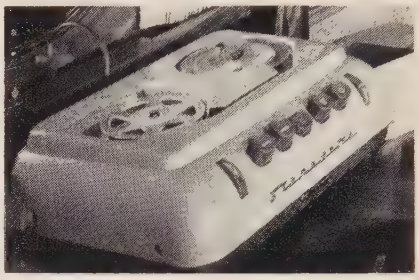


Adhesive Resists Aircraft Fuels

Heavy Duty Waterless Cleaner



Lycoming 6-Cylinder Engine



Stenorette for Airborne Exec

nu-avi-quip

ght Weight Axial Flow Fan ols Helicopter Engine Oil

A special design using light alloy tal construction saves 23 percent of evious weight of Axial Flow Fan th the same external dimensions as e earlier, heavier model.

Developed by Pesco Products Div., rg-Warner Corp., the fan is used for oling engine oil on several makes of licopters. Weight is 17 lbs. It is rated 4650 cfm at 7.8 inches w.g. and 6200 m. It requires 7.3 hp and is driven by iming V-belt from a shaft connection the helicopter engine. Rotor tip ameter is 14".

Circle No. 36 on Reader Service Card

sposable Galley Bag

Porta-sink, a waterproof, flameproof g, is a new development to be used hold galley refuse accumulated in ght. It is an easily disposable one-p container that eliminates the need r receptacle clean-up at destination. ie bag's ability to hold liquids for long riods of time makes it popular for posit of paper cups, milk cartons and her beverage containers without first opping to empty them in another ceptacle.

The bag has two strong plastic han-es, making it convenient to carry or ng in an aircraft galley.

Circle No. 37 on Reader Service Card

Amplifying Speaker

A new transistorized amplifying speaker with 10-watt output is designed to be used as an output speaker in aircraft for one or more receivers or intercoms. Frequency response is selectable with an external switch, providing either voice communication frequencies or full broadcast response.

Unit weighs 22 ounces complete, and requires 2¾″ deep by 5″ maximum diameter. No shockmounting is required.

Circle No. 38 on Reader Service Card

Lycoming 6-Cylinder Engine

Lycoming Div., AVCO Mfg. Corp., announces new 6-cylinder direct drive engine for business aircraft. This Model develops 250 hp, weighs 396 lbs. (Model 0-540-A1A). It received CAA Cert. No. 295. It measures 25.81 inches in height, 33.37 inches in width, and 37.22 inches in length. Uses min. 91/96 octane fuel and features dynafocal mounting.

Circle No. 39 on Reader Service Card

Synthetic-rubber Adhesive Resists Attack From Aircraft Fuels

Pratt & Whitney Aircraft engineers have found that using modern adhesives for assembling the seal to water injection regulator supports instead of pinching seal into the seat results in improved seating characteristics.

By use of an adhesive which resists attack from aircraft fuels of every type, P&W produces a tight, long-lasting bond between the seal and the diaphragm support of water injection regulators for double Wasp and Wasp Major engines.

Circle No. 40 on Reader Service Card

Stenorette for Airborne Executives

The compact magnetic dictating and transcribing machine is one of the features in this business plane. This portable machine offers 30 minutes of dictation in each reel of reusable tape, automatic review, automatic erase and correction, as well as remote control operation through flick-of-the-thumb microphone control.

Circle No. 41 on Reader Service Card

Heavy Duty Waterless Cleaner

Those charged with housekeeping and maintenance operations can now use but one product for cleaning. Stratogel is a waterless concentrated paste-cream cleaner—quickly and easily applied with damp cloth or sponge. It is used to remove oil, grease, scum and other soils from unpainted and painted metals, painted and varnished wood, glass, plastic, linoleum, tile, porcelain, as well as many other substances, including engines and leather furniture.

Circle No. 42 on Reader Service Card

Maintenance Bulletin

These maintenance notes are compiled and edited from recent CAA air carrier maintenance branch, general aviation maintenance summaries and business aircraft operator reports, and are mailed to all NBAA members as part of their membership service.

AERO COMMANDER

Model 560—*Carburetor Heat Valve Arm to Shaft Pin P/N-5610139-1*—Retaining pin "worked" free of connection, making application of carburetor heat impossible.

Model 560A—*Propeller Governor Pulley Bracket*—Inspection disclosed cracks in pulley bracket, mounted on forward side of firewall. Cracks were occurring in area of bolt holes.

Gear-Retract Cylinder Support Plate P/N-371009-3—Difficulty encountered on attempt to retract gear. Investigation disclosed part failed, resulting from crack extending through retreat cylinder attachment hole.

Model 680—*Flap Actuating Cylinder Seal P/N 2026*—Flap actuating cylinder seal retaining snap ring became disengaged, resulting in loss of hydraulic fluid.

Lower Link Assembly (Nose Wheel Extension Mechanism)—Failure of link occurred. Suggest inspecting mechanism for progressive condition brought about *by towing operations.*

Accessory Housing Cover Assembly P/N-68440—Subject part was found cracked. Crack emanates in proximity of mounting stud boss adjacent to raised starter mounting flange.

R & L Inboard Flap Sections—Inspection disclosed cracks appearing. Loose rivets were observed in both inboard and outboard flap sections.

Fuel Line to Primer Solenoid—Fuel line from fuel pressure gauge line failed. Probable cause was vibration, inasmuch as line was not supported between firewall and primer solenoid.

BEECHCRAFT

Model D18S—*Fuel Line*—Difficulty encountered in maintaining proper fuel pressure. Inspection disclosed pin holes in line in area extending under left battery support where cabin heat duct and left rear fuel line runs parallel.

Model E18S—*Carburetor Hot Air Ducts*—Reports indicate accelerated wear of hot air ducts occurring where they connect with stainless steel heater jacket adapter.

Oil Pressure Line—Upon checking for source of leak. oil pressure gauge line extending from engine to firewall was found chafed through. In this particular case the subject line had been routed close to a parallel line, resulting in them making contact.

Model D18—*Doubler*—Right and left Outer Wing Rear Spar—Doubler located on aft side of rear spar of the outer wing panel was found cracked at the cutout for the aileron control rod.

Landing Gear—While lowering the gear for landing, a loud thump was heard by the flight crew. Gear indicated normal extension and landing was made without incident. Inspection disclosed: landing gear shaft drive gear was warped, clutch keys were worn and the dynamic brake relay contacts were burned. All defective parts were replaced.

Model 35—*Nose Gear Retract*—Link End *"Heim HM5"*—Part failed in threaded area flush with outside end of jam nut. Examination of failed part revealed progressive condition prior to complete failure. The failed part was of the hollow type, contrary to Beech Service Letter No. 35-11, dated September 19, 1947, which recommends replacement with the solid type HM-5S part.

Model D35—*Elevator Tag Bungee Spring P/N-35-524381*—Subject part failed at forward position where end loop of spring connects to attaching clip.

Model F35—*Auxiliary Fuel Wing Tanks (Outboard)*—Fuel tank was empty of fuel; gauge indicated one-half full. Investigation disclosed fuel cell collapsed against fuel gauge transmitter floats, holding them in center of their normal travel.

Model B50—*Elevator Ribs P/N 61000-152 and 610000-138*—Report indicates finding elevator ribs at stations 24.000 and 37.375 cracked. In addition, cracks were observed in the trim tab spar.

Model C50—*Nose Gear Well Doors*—Unusual noises inside nose wheel well doors prompted drilling hole to ascertain the source. This resulted in a quantity of water being drained through drilled hole.

Model E18—*Elevator Control Horn*—The subject part where attached to control column torque tube under cabin floor was found cracked in area of both taper pin holes.

Spring-Elevator Down P/N-414-187-003—Spring failed in area adjacent to first coil.

Cowling Assembly (Engine Inner) P/N-414-185911-61—On inspection, the top area of subject assembly in proximity of "Adel" clamp, was found cracked.

Model B35—*Front Engine Support Assembly P/N-35-910275*—Removal of assembly disclosed severe cracking in support.

Cowling Support Rod, P/N-35-910108—Difficulty was encountered when cowling support rod contacted the battery relay terminal. Investigation disclosed that the rubber boot on the relay was not in place.

Front Engine Support Assembly P/N-35-910275—On removal of cold air inlet duct assembly, P/N-35-550502, it showed that lower flanged edge of the duct had chafed through rivet heads attaching plate to adjacent structure. Further, the flanged edge in question had chafed approximately halfway through the plate thickness.

Model B50—*Elevator Trailing Edge Beam P/N-50-610000-94*—In two instances cracks were observed in the flange bend radius of the subject part.

Model D50—*"Pesco" Fuel Pump*—Difficulty was encountered in controlling fuel pressure. Inspection disclosed brass retaining nut backed off pressure relief side of rubber diaphragm.

CESSNA

Model 170A—*Rear Spar (elevator)*—Inspection disclosed damage to the part, apparently caused by excessive vibration of No. 2 rib (left elevator) and rear spar.

Model 172—*Landing Gear Spring Attach Bolt P/N-0541153*—Inspection disclosed movement in left landing gear. Inspection disclosed subject bolt crystallized and failed in thread area flush with nut.

Starter Switch (Delco Remy)—P/N 1909305—On removal of the starter switch, a crack was observed in the switch housing. In the event of complete failure, the lead from the battery solenoid would be free to move in the engine compartment.

Propeller Oil Control Valve—The 8-32 screw (AN500A Series) backed out of part, entering carburetor air intake.

Models 172, 182—*Attach Screw (Fuel Tank)*—Fuel was observed leaking from wing panels on both wings. Inspection disclosed fuel gauges were loose where they mount on the fuel tank.

Models 180, 182, 182A—*Filter-Carburetor Intake Air P/N-0750127-10*—Failure of inner screen has occurred at the aft folds. Should this occur, there is possibility of portions being sucked into engine induction system.

Model 180—*Piston Pin P/N-530845*—The aluminum plugs (2 each) in the ends of all six pins worked outward toward cylinder wall, resulting in plug ends being mushroomed. Condition can usually be identified by visual inspection of cylinders along an area where pin operates against cylinder wall. Inspect cylinder barrels externally at base of cooling fins for evidence of burnt paint and rust in area about ½ inch wide and length of piston travel. If this condition is observed, the above difficulty probably exists.

Bulkhead Assembly Front Section Tunnel Left P/N-0791300-5—Subject assembly was cracking in area where rudder pedal bulkhead attaches.

Stringer-Engine Mount Lower P/N 0713006—The part was found cracked. Cracks extended through the two rivet

les in bottom of channel and in radius both sides of firewall end.

Model 182—*Sump Assembly—Oil*—l sump drain plug failed, resulting om crack in weld area. Condition was gravated by throttle arm striking ain plug.

Door Hinge Rivets (Lower) P/N-11579-5—Three rivets which attach or hinge to door flange pulled out.

Model 310—*Nose Bulkhead P/N-13140-5*—Cracks developed in bulkad forward of nose gear at station . 52.06.

Landing Gear Scissor Link Assembly enter tie)—Difficulty was encountered landing roll, attributed to disengageent of landing gear torque scissor ks on the right landing gear. Investiion disclosed that standard AN-960-5 sher had been installed under the t, which couples the links at the cen- tie. Manufacturer recommends the e of two AN-960-7161 washers.

Pilot's Seat—Aft stop assembly led, permitting seat and occupant to de into rear of cabin. Inspection disosed that the flange of stationary seat mber bent outward, thus making the p lug ineffective.

Models 170, 172, and 182—*Instrunt Panel*—The instrument panel rening nuts were found loose; some d backed off completely. Operators port installing lock washers under ts to correct condition.

Model 170A—*Elevator Cable P/N-10105-4*—Inspection disclosed cable ying at pulley under floor assembly station 44.0.

Models 170B, 172, 180, 180A, 182 d 182A—*Wing to Fuselage Fairing*—e extreme aft screw which secures aft wing butt to fuselage fairing is afing on the right and left flap upper face when the flaps are in the "up" sition. Operators report correcting s condition by replacing the original azier head type screw with the unter-sunk type.

Line-Oil Pressure-P/N-0-500106-26—pper tubing located right rear side engine, near firewall, failed in porn contained in the expansion loop.

Model 182—*Throttle Arm*—The new e throttle arm worked off throttle aft, permitting carburetor butterfly ve to close, resulting in forced land-g.

Model 310—*Propeller Anti-Icer Flex nes*—Excessive alcohol loss was obved during testing of propeller anti- r system. Inspection disclosed kage in flex lines in each nacelle. rther inspection revealed the flexible ohol carrying lines which extend ng the exhaust stack had been heated a point where they had become hard d deteriorated.

(Editor's Note: Because of the length the Maintenance Bulletin only a porn of the material is presented here. xt month's issue will continue this ormative report. Heavy multi-engine siness aircraft will be emphasized. e complete bulletins have been, and ularly are, provided all National siness Aircraft Association mems.) END

Round Table

(*Continued from page 56*)

in the design of the engine to get proper distribution of T.E.L. so that correct proportional combustion materials are in the cylinder at the time we fire it with the spark plug. I think there needs to be a combined effort to get the complete job done of eliminating spark plug fouling.

Campbell: I'm sure that most of you know that there is a very close liaison between the oil companies, the spark plug and the ignition manufacturers. We are constantly working together with these people to see what can be done.

J. M. Church (*AC Spark Plug*): In developing any new type spark plug, we certainly must work closer than we ever have with the engine manufacturer and the fuel producers. In our new aircraft spark plug testing equipment we are using aviation fuel to secure the effects of fuels on heat ranges of spark plugs and also to determine any relationship between fuels and gap erosion rates.

We have three new approaches to spark plug anti-fouling characteristics. One is the new 273 spark plug, a hotter plug, which we have been working on with WAD (Wright Aeronautical Division) for the 1820-84 engine. We've also been working with Franklin Aircooled on a new platinum electrode spark plug and have developed a new double radius massive type electrode with anti-fouling characteristics for general usage. Maybe Jim Shimek would like to add some comments on spark plug fouling.

J. M. Shimek (*A.C. Spark Plug*): Certainly all three of these physical designs have helped the situation as far as fouling is concerned. Proper heat range and adequate scavenging areas are primary in the design of anti-fouling spark plugs. In addition to problems associated with the business end of design, we have found that there is a definite correlation between barrel design and plug fouling. We made quite a study of plug fouling in light twins and out of a group of 28 sets of plugs that were removed at low time due to fouling, 60% of those were fouled due to shortage by dampness in the insulator well. That is why we developed and have emphasized the ¾-20 barrel plug type for use in the light twins. Of course, when light twins were flown in good weather only, barrel moisture was no problem. Now that they are flown in all types of weather, we find that water in the barrel well and resulting flashover is a major contributor to plug fouling. In tests where we ran one engine with ¾-20 plugs and the other engine with ⅝-24 plugs there was no comparison of performance. I would say that by going to ¾-20 harness and plugs that the twins will eliminate 70% fouling. What do you think, "Doc"?

Anderson: I certainly support that 100%. Progress has been slow in getting the small engine manufacturers interested in going ahead with the ¾-20 "All-Weather" plug. This is probably because of lack of experience and knowledge of the plug's ability to do a better job in the field. It has been fully accepted by the airlines. We believe here is a benefit the small aircraft engines can inherit from the experience on the larger engines.

Now that small twins are being instrumented completely and are required to accept the same weather conditions that the airliners go through, they are faced with the same severity of operating conditions. The ¾-20 "All-Weather" plug is certainly a step in the right direction in getting the protection required to combat and accept the more adverse weather operations that they are flying in today. I think the trend is already started and future progress will be more rapid.

Campbell: Mr. Fisher, have you any comment or statement?

B. C. Fisher (*Neutronic Development Co.*): Mr. Smith, on the additional lead on the engine tests, have you found any lack of power, any drop in performance, using the higher leaded content fuel without resetting?

Smith: No, none whatsoever.

Fisher: I might mention something on fouling. Excess heat will cause fouling in the nose of any spark plug. If that can be prevented, we will have no trouble.

Campbell: There is a tremendous amount of work going on constantly to try to get a one run spark plug so that we can go from one operating period to another without having to remove it. The operators, of course, have a schedule to make, so you can't hate them for pulling the equipment off the engine. They take the oil, spark plug lead and the spark plug at one grab and will worry about which was the offender later. That hurts our pride a little bit. Each of the manufacturers of the components hates to see his equipment removed unnecessarily. But, we also can appreciate what the operator is up against, and he isn't going to sit around all day to determine what is wrong.

Kovac: It will certainly be appreciated by the users. I thought it might be apropos to mention the work that has been done with thermocouples to measure the cove temperatures to determine the spark plug that an engine require for good operation. Where these small engines are experiencing an excessive amount of fouling, this type of work might be done to determine whether the plugs that they are using are of the proper heat range. Fouling can result from low power operation. Also, we can have fouling, as mentioned, from high power operation. The correct spark plug should be selected for each specific engine under operating conditions.

(Editor's Note: The importance and keen interest shown by the numerous facets of the aviation industry in this vital Round Table topic of spark plug and ignition operational characteristics by so many leaders warrants our carrying it over. Read the balance of important phases in next month's issue: Heat Ranges, Detonation, Valve and Piston Burning, Ignition Harnesses and Leads, etc.)

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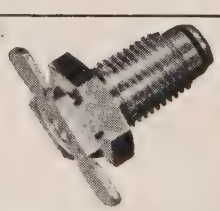

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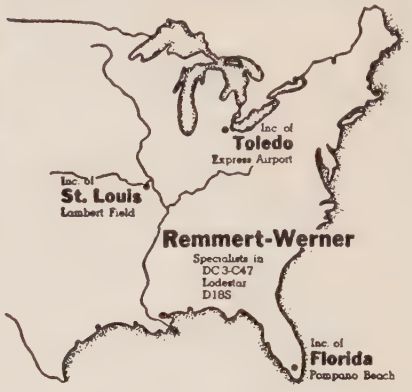

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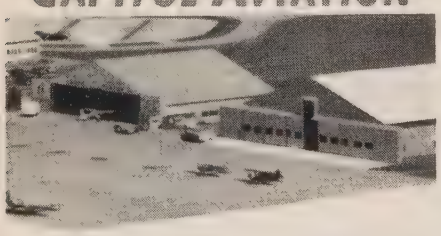

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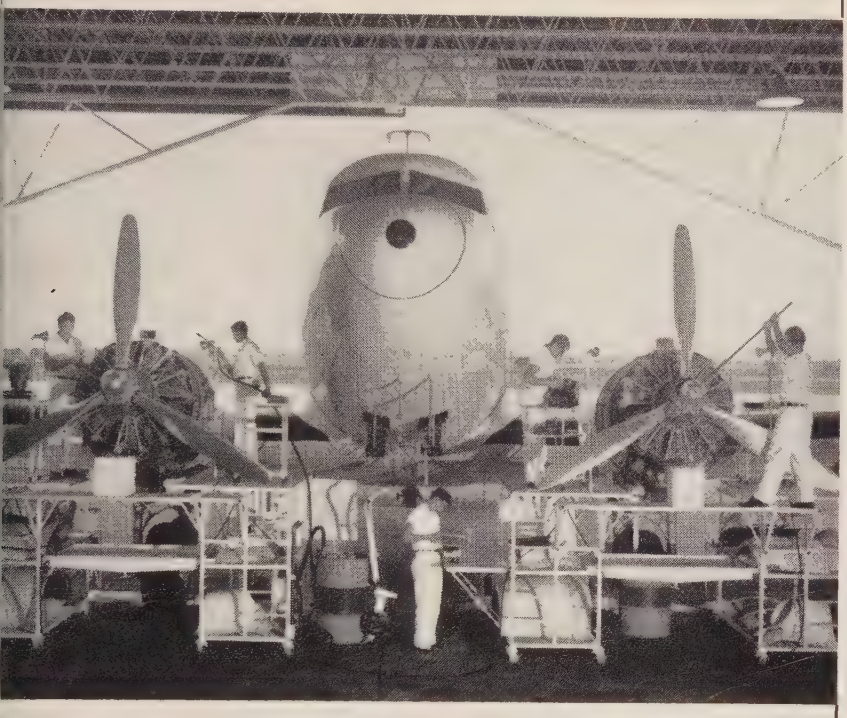

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AVIATION INVESTMENT OPPORTUNITY. Capital needed to further development of twin-engine amphibian in a price range considerably below existing twin-engine amphibians. Skyways Box No. 756

Fairchild F-27 To Have "LIFE"

Fairchild Engine and Airplane Corp. has just completed arrangements with Lear, Inc., to offer "LIFE" as optional equipment in their F-27 Friendships, Bill Lear told Skyways. "Fairchild has also offered both the new L-5B autopilots and B-102 autopilots, along with the complete line of the new Lear executive anrcraft radio equipment known as Nav-com," Lear said.

The "LIFE" (Lear Integrated Flight Equipment) manufacturer reported that he spent all of last month personally demonstrating the new L-5 equipment in his Beechcraft N-34L.

Among first plane owners to have the new equipment installed in their aircraft are Paul Butler, who is also getting the Nav-com units; movie star Robert Cummings; and Henry L. Timkin.

Lear told Skyways that he will unveil some "revolutionary" new products at the Ninth Annual Maintenance and Operations Meeting, June 6 and 7, at Reading Municipal Airport, Pa.

Staff Member Named

Robert K. Polson, early advocate for applying Time, Rate and Motion principles of Industrial Engineering to the Business Aircraft field, joins the Skyways' Staff as a regular contributor. His experience stems through B-24 Flight Instructor, plus ATR and Flight Navigator's Certificates, in addition to having flown for airlines as well as business firms. He has lectured before the Institute of Navigation and has been associated in the consulting field with Flight Safety, Inc., and Aeronautical Consultants & Associates.

Navicom

(*Continued from page 34*)

ment flight activity has multiplied in the last few years (a 50% increase in IFR approaches in 1957) the Weather Bureau has managed to continue in operation with essentially the same basic appropriation only at the cost of closing stations and reducing service.

One out of five of the weather bureau airport stations is now operated *on a part time basis.* The overall number of forecasters available is down more than 20% in the past 10 years of greatly increased aviation activity resulting in a decline in the quality of forecasts and in service to aviation.

NBAA urges a wide program to restore most of the foregoing vital services and improvement commensurate with increased needs of the flying public. It also points out that hearings on the weather bureau budget are now in progress in the Senate and House Appropriation Committees and urges that all the flying public and industry join NBAA in informing the committee members of the foregoing facts. The safety of all flying, *including yours*, is at stake!

Safety Digest

(*Continued from page 42*)

aircraft industries as aeronautical engineers. Engineering constitutes the greatest portion of the course. You can find the engineering answers to almost any problem, whether it pertains to our present day equipment—Beechcrafts, DC-3's, Lodestars, Convairs, Viscounts, etc, or any new equipment you may be considering such as turboprops or jets. After you have been shaken loose from your seat (belts and shoulder harness no help at all) with a review of algebra, geometery, trigonometry, calculus and physics, at a speed that would make the F-104 look like a cub, you find that Professors Fairchild, Hurt and Nielsen now tie all your new and rejuvenated knowledge together, and apply it to everyday and future problems.

Many of us take a negative attitude when we think of phsysiology and psychology in relation to Aviation Safety. This part of the course I accepted with subconscious reservations. However, it did not take many minutes in either Dr, Barron's or Dr. Warren's classes for me to realize, "headshrinkers" or not—they had something! Their findings in reference to problems of human engineering, human reactions, physical and mental well-being, their methods for ascertaining the proper solutions to these and many more problems, have a definite bearing on Aviation Safety—you should avail yourself of this knowledge.

Last, but far from least, let's discuss Jerry Andrews and his part of the course. Jerry has been around aviation ever since it was a pup. He has an abundance of material and a wealth of experience to back it up. He proves how proper accident investigation is one good way of preventing the same accident from happening again.

Don't be an ostrich, face the fact that knowledge is an essential factor in preventing aviation accidents . . . send a representative from your company to the Institute.

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PROPELLER

Greenhouse Patter

By "Torch" Lewis

Taking off from Teterboro a f weeks back Elmira bound, we we climbing out over PNJ beacon wh alluvasudden the right prop went up 2700 RPM without even bein' asked, we nacherly did a fast one eighty a landed back on Rwy. 6 again. The me wagons were out plus a funny look old geezer in asbestos underwear astri the fire truck. Between bounces, I g em the ole Ballantine sign and th took out for the barn.

Not, however, before they was spott by a pop eyed young Ivy Leagu gawkin out the pitcher window on I first time up. Not oney that, he has impart this intelligence to the oth passajeros who up to this point we only scared but half way out of th socks.

Well, we sent the people home on a lines on accounta we had a busted ge in the nose section and our mecha Ham Hands Vernali, was waitin Elmira.

We go home next day and you shoul heard the story by the time it g pumped up. Burning decks and flyi navels, intrepid crew manning bat stations, holy cow wait till I get r hands on that kid. I'll take him up the village Stearman and wring him o till his eyeballs tumble.

Went down to JAX after that a parked at Laurie Yonge's ramp night. There is a live wire outfit. Co teous and helpful linemen, Laurie's p sonal attention, whether it be airycoupe or a double-breasted L heed. They makes you feel like they happy to have you aboard. Laurie Mr. Aviation in Jacksonville. How d ferent it is from LaGarbage or Idleb where if you manage to get down w out being smashed into by flying planes, you have a very good chance augering into one of the hundred up hundreds of ground vehicles. The ground vehicles have two speeds. F stop and full ahead. They are mann by a special breed of maniacs who h formed an association known as t Lawn Gyland Airport Hot Rodders a seniority and rank are largely de mined by number and frequency dents that one has made in fuselag wheel well doors and the like with largest score being awarded for a b prop. I understand the association striking a special medal for the t mower operators in San Antonio w refused to be bluffed out of the way Ralph Whitworth's Super Ventura fo ing him to ground loop. Did a good j but the plane will be OK.

Almost time to start thinkin abo NBAA Annual blast in September (24) to be held in the City of Brothe Love, Pa. Personally, I prefer the s terly variety. Along this line I unnerst that the dolls lined up as candida for Miss Business Aviation 1958 a really eyestoppers. Don't envy the g who have to make The Decision.

Grapevine indicates that, besides M Biz Av, there'll be other worthy sigh Let's go see.

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